DISSERTATION

RAND

Incentives in a Specialty Care Carve-Out

Moira Inkelas

RAND Graduate School

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PREFACE

This study examines the impact of a payment strategy for specialty services in a transition to Medicaid managed care. It presents results from a natural experiment created when California expanded participation in Medicaid managed care, and excluded certain specialty services for children with qualifying medical diagnoses. The study describes the policy's impact on caseloads and expenditures and includes a qualitative evaluation.

The findings from this research should interest policymakers, agency administrators, and health services researchers interested in designing, implementing, and evaluating special payment policies as part of a managed care program.

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SUMMARY

Most state Medicaid agencies are turning to capitated prepayment to contain costs, to improve access to care, and to increase efficiency in the provision of services. However, many states have concerns about how the financial incentives that accompany prepaid care could affect services to chronically ill beneficiaries. Medicaid agencies are implementing a variety of prepayment strategies specifically for children with chronic conditions, often intended to reduce financial disincentives for providing adequate care. They range from excluding certain services, to allowing voluntary enrollment in prepaid health plans for some children while requiring others to enroll. Some have questioned how these different policies will affect provider behavior, and how this in turn will affect the care that a child receives.

California implemented a set of dramatic changes to the delivery of health care to Medicaid beneficiaries during the 1990's. Much of the policy debate over access to services focused on how to preserve specialty care access for children with complex medical diagnoses while also improving access to primary care to the general population. As California's ambitious plan to expand managed care unfolded in its largest counties, a legislative effort preserved the traditional role of the Social Security Act, Title V Children with Special Health Care Needs program in authorizing services under the traditional fee-for-service system. Child Medicaid beneficiaries who are eligible for Title V are those with complex medical diagnoses.

This legislation created new relationships between physicians, health plans, and county Title V programs (called California Children Services, or CCS) as well as new financial incentives that encouraged referral of potentially eligible children to CCS. When providers are placed at financial risk for medical care with specific services "carved out" from their risk, a financial incentive to shift costs to the excluded services is created. Theoretically such a policy creates a financial incentive for the provider to refer children to the entity responsible for the carve-out services whenever eligibility is suspected. It also creates an incentive for identifying services as related to the qualifying diagnosis. Thus the CCS carve-out policy may affect both the volume of CCS participants and the volume of services identified as CCS-related. This study highlights the impact of such a "carve-out" approach on children's participation in CCS.

Purpose of the Research

The specific aims of this study are:

(1)   To determine whether the financial incentives of a carve-out policy increase "case-finding" of children with Title V-eligible conditions, and composition of the CCS caseload; and

(2)   To determine how "carving-out" specialty services during a managed care expansion affects total CCS expenditures.

Policy Relevance

How providers respond to capitated prepayment for services to chronically ill and disabled children is a significant consideration for children and their families, for the outcome of Medicaid managed care expansions, and for policy-makers who expect prepayment policies to control costs. There also are policy implications from a public health perspective, because Medicaid and other State-administered public health programs have outreach and related program participation goals designed to promote population health. Because State Medicaid programs are a traditional "safety net" for low income and chronically ill individuals—especially for children, who are the largest group of beneficiaries—they have a particularly vital policy interest in the effects of new financial incentives. States also continue to have public health responsibilities for policy development, assessment, and assurance, as well as a mandate within their state-operated Medicaid programs to assure health care access for many low-income and chronically ill beneficiaries. At the same time, state programs continue to operate under the federal Title V mandate to assure a comprehensive system of care for children with costly, complex medical diagnoses. In some states, both the medical care delivery system and Medicaid funds are handed to the commercial managed care sector while the Medicaid program adopts an oversight role. Thus the expanded use of managed medical care systems challenges these state agencies to oversee how care is provided and to focus on system outcomes and system improvement.

Despite the new incentives that are evolving, and the policy questions that result, state agencies are not always well equipped to monitor the effects of new payment systems. The first reason that effects of Medicaid managed care on chronically ill children are not well understood is that relatively few children have intensive health care needs and thus have not been the initial focus of managed care studies. Moreover, some states initially excluded children with specific medical diagnoses from Medicaid managed care expansions, or excluded children's specialty care from these new prepayment systems. Second, it is difficult for states to identify policy effects because of difficulties in the following: (1) identifying appropriate comparison groups; (2) studying a representative group of beneficiaries; and (3) discerning the impact of other trends. The result is that states currently have few data that can guide how they develop, implement, and evaluate payment policies. State Medicaid agencies benefit from understanding how payment policies affect service use and costs. There is additional value in examples of how new payment policies affect public health care case-finding objectives and how these policies can change public program roles from service provision to a combination of service delivery, policy development, and advocacy.

Study Design and Methods

This study uses data from California—a state that implemented Medicaid managed care earlier and more extensively than most other states—to understand the financial incentives of a "carve-out" payment system for children, and to understand the impact on (and response of) public health care agencies. In the 1990's, California initiated a phase-in of mandatory Medicaid managed care—on a staged county-by-county basis—for most children, including those eligible for Title V Children with Special Health Care Needs (with diagnoses such as spina bifida, congenital anomalies, and cerebral

palsy). Children required to participate in managed care included those receiving welfare benefits or meeting general low-income Medicaid eligibility requirements. Following special legislation, Medicaid services relating to a CCS eligible medical diagnosis[1] were excluded from managed care contracts and reimbursed on a traditional fee-for-service basis. The difficulty in determining whether specific services are required exclusively for a particular diagnosis suggests that this mixed reimbursement policy could motivate cost-shifting from capitated care to the carved-out services.

The CCS carve-out design not only creates financial incentives but also introduces a new participant—the prepaid health plans—into the CCS referral process. On the provider side, response to the carve-out policy is driven by physicians, hospitals, and the prepaid health plans. Perceived costs and benefits of CCS referrals are expected to influence their CCS referral practices both prior to and following implementation of the carve-out policy. The fiscal agents include the Medi-Cal field offices that authorize services for fee-for-service (FFS) Medicaid beneficiaries, and the local CCS programs that administer the carve-out. State policies and procedures, local variation in authorization practices and outreach, and any local responses to the carve-out are expected to influence any public agency contributions to post carve-out changes. Any combination of referral and authorization practice patterns on the part of these different institutions could contribute to carve-out impact.

This study seeks answers to several questions. Does the volume of CCS program participants increase with the carve-out? Does the composition of the CCS caseload change as greater numbers of "marginally eligible" children, and requests for "marginally CCS-related" services, are referred to CCS? Do total CCS expenditures increase? Do per claimant CCS expenditures change as the caseload expands to include more children with low or moderate cost needs? Do per claimant expenditures increase as more services for each participating child are handled by CCS?

It is possible to study the impact of the carve-out policy using several comparison groups. The comparison groups including the following: (1) beneficiaries in the managed care expansion counties prior to and following the carve-out; (2) children with CCS eligible diagnoses who are in specific Medicaid eligibility categories (such as disability-linked Medicaid) that are exempted from the managed care requirement; and (3) counties that are not implementing Medicaid managed care. This study analyzes 1994-1997 Medicaid claims, covering the pre and post carve-out periods, to examine how the "carve-out" policy affects program participation and total costs of care. A difference-in-differences model employs a pre-post design with a control group to capture policy-related as well as other secular program participation and cost trends. Specifications that measure carve-out impact as a function of the level of managed care participation also are evaluated. Results from the quantitative analyses were supplemented with qualitative findings from interviews with several CCS program administrators.

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[1] The specific exclusion refers to specialty services provided to children with Title V eligible medical diagnoses. These are diagnoses recognized in state Maternal and Child Health Block Grants as entitling children to case management and supplemental medical services. The administering program in California is called "California Children Services", or CCS. Details are provided in Chapter 3.

Findings for Identification of Program Eligibles

The carve-out policy caused CCS claimant volume to increase.
It appears that the "case-finding" incentives of the carve-out policy caused more children to be identified as CCS eligible. In general, the carve-out implementation was associated with increased participation in the CCS program within the managed care expansion counties. This occurred in counties that implemented California's "Two Plan" model with competing health plans in a county, as well as in new, delegated county-run health plans ("County Organized Health Systems", or COHS). The effect of increased managed care participation was evaluated for the group of children required to enroll in managed care in Two Plan counties, controlling for Medi-Cal enrollment and time trend. Combining the expansion and selected non-expansion comparison counties, claimant volume increased with the rate of managed care participation. This occurred for both mandatory and non-mandatory groups. A further analysis of the initial months of carve-out implementation, and the later months of implementation when the carve-out was fully operational, shows that the carve-out effect was concentrated in the full implementation period. Low managed care participation rates in the initial months after implementation is a likely explanation. Moreover, managed care participation was technically voluntary during these months, termed "pre default", when one of the two plans was not yet operating and beneficiaries who did not select a plan were not assigned a plan by default.

There was variation in carve-out impact on claimant volume across the expansion counties. Total claimant volume increased most substantially in the COHS counties and in several Two Plan counties that did not have a history of Medi-Cal managed care.

Carve-out impact among those in aid categories that were mandated to participate in some, but not all expansion counties, appeared to be greater with mandated than with voluntary participant groups.
Using several large Medi-Cal aid categories, it was possible to compare post carve-out trends among expansion counties that had different managed care requirements for those aid categories. This also was done due to the heterogeneity within the mandatory and non-mandatory groups; each included a large number of distinct eligibility aid categories, and different time trends could affect claimant volume across the aid categories. One aid category included children receiving public cash assistance. It was of special interest because of a decline in total enrollment by approximately 15 percent over the study period. Another aid category included children not receiving cash assistance but eligible for Medi-Cal due to low family income, and had more stable enrollment. Overall, CCS claimant volume increased for the largest *cash assistance* aid category and for the largest *non-cash assistance* aid category. The effect was most substantial in the COHS counties. Findings for the Supplemental Security Income (SSI) group that was mandatory in COHS counties and voluntary in Two Plan counties diverged somewhat. Using a set of pre and post carve-out indicators, there was no increase in claimant volume for SSI beneficiaries in expansion counties where managed care was voluntary for these beneficiaries. In contrast, in the two COHS counties where managed care was mandatory for these beneficiaries, SSI claimant volume did increase.

Increased claimant volume was evident across diagnosis categories, indicating that the carve-out increased CCS authorization for many different types of claimants.
Evaluation of claimant volume by diagnosis category showed significant carve-out impact across most diagnosis categories, controlling for covariates and in comparison to non-expansion counties. The impact of managed care participation increase for the mandatory group was not constant across the diagnosis categories and was particularly significant for claimants with an endocrine/metabolic/nutritional diagnosis. One possible explanation is physician referral and health plan referral practices that caused more CCS-authorized services per child, somewhat independent of diagnosis. Changes to CCS program authorization practices in response to the carve-out could have affected services authorized for CCS eligible children across diagnostic groups. Some of the increase across diagnosis categories could be an artifact of the expansion/carve-out that is not a caseload increase. Greater variability in claim coding with respect to diagnosis could contribute.

CCS program administrators attributed increased CCS case-finding to changed provider referral practices, health plan involvement, and Medicaid and CCS program responses to the carve-out/managed care incentives.
Health plans and physicians alike had a clear financial incentive to identify and refer CCS eligible children to the CCS program. Health plans were a new participant in the identification and referral process. The health plans provided infrastructure for case-finding and referral in addition to having the financial incentive for referral, given their financial risk for certain specialty and inpatient services. Results from interviews with several county CCS administrators indicate that the perceived changes taking place in provider referral practices seemed to encompass all potentially CCS eligible children, whether they were in a mandatory managed care group or a non-mandatory managed care group. While some of this change can likely be attributed to the financial incentives for physicians and health plans, there are other explanations for the increased participation. According to CCS administrators in several managed care expansion counties, California's carve-out of CCS services increased the visibility of the CCS program not only to the provider community but also to the local Medi-Cal offices that are one source of CCS referrals. Overall, the findings indicate that the carve-out policy stimulated a combination of practice changes that led to increased CCS program participation.

Findings for CCS Expenditures

The carve-out did not cause a significant increase in total CCS-authorized expenditures in most managed care expansion counties.
Despite increases in monthly claimant volume, the carve-out generally was not associated with increased monthly CCS-authorized expenditures. Increased CCS expenditures during the study period were found in COHS counties but not in all Two Plan counties. When compared with non-expansion comparison counties, however, no overall increase in expenditures was found for the Two Plan or the COHS counties. COHS results were sensitive to the group of non-expansion counties used as a comparison group, however, and showed a significant increase when compared to eight counties with independent CCS programs but not when compared to these counties in addition to several other metropolitan non-expansion counties. While findings at the aid category level were

sensitive to the type of specification used, there was some indication of increased expenditures within the SSI aid category only, in the Two Plan and the COHS counties. No increases were found for the larger cash assistance and medically needy aid categories.

The carve-out was associated with a decline in expected monthly costs per CCS claimant, but a statewide trend toward lower per individual expenditures appeared to dominate the trend.
Monthly expenditures for a child having a CCS claim declined in COHS counties with a trend toward decline in Two Plan counties. Median and 75th percentile claimant expenditures for the mandatory group in Two Plan counties appeared to be lower after the carve-out. Per claimant CCS expenditures are skewed; for example, for the mandatory group in Two Plan counties, the post carve-out median monthly claimant expenditure was $254 while the mean was $4,188. This finding was consistent with the expectation that higher volume post-carve-out claimants in the lower tails of the cost distribution would lower the claimant cost at the median and upper tails of the distribution. However, this finding could also be explained by an independent time trend of declining per claimant expenditure.

The carve-out was associated with an increase in monthly claimants receiving CCS-authorized ambulatory services, such as physician services in office and outpatient settings, and hospital-based outpatient services, and an increase in claimants receiving pharmaceutical authorizations.
The number of children with claims for ambulatory physician and for hospital outpatient services increased with the carve-out. In contrast, and as expected, there was no change to the monthly number of children receiving inpatient hospital services. Hospital inpatient stays were expected to be less sensitive to carve-out incentives. It was not hypothesized that the volume of newly identified children with cost-intensive, medically complex diagnoses would increase significantly with the carve-out. Findings were consistent with this expectation given the lack of significant expenditure increase for inpatient hospital services. Among those claimants mandated to participate in post carve-out managed care, monthly expenditures for physician office services, and hospital outpatient services, declined per recipient of those services. This suggested lower intensity service per recipient, which is consistent with a carve-out effect of increasing CCS program participation among "marginally eligible" children with lower expected CCS costs. For the non-mandated group, expenditures per recipient of the service declined for pharmaceuticals, hospital outpatient, and rehabilitation hospital services, though not for ambulatory physician services. Results tended to show that rather than increasing total expenditures, the carve-out tended to increase the number of low average expenditure claimants.

It is also possible that the expansion/carve-out caused systemic changes with effects not limited to those formally "exposed" to the carve-out effects. While this argument is plausible and is consistent with the observations of those CCS program administrators interviewed, this remains only a hypothesis.

Findings for Carve-out Impact on the CCS Program

The carve-out appeared to broaden the CCS role in authorizing services for which the program would not have been involved prior to the carve-out. Organizational changes were stimulated by the managed care expansion and CCS carve-out. Extensive contact between the local prepaid health plans and the CCS program took place along with expanded outreach and community education regarding CCS program eligibility. When the carve-out was adopted, the CCS program implemented a defined time window within which CCS medical eligibility would be determined. The carve-out also facilitated CCS enforcement of provider paneling standards for a larger proportion of CCS eligible Medi-Cal beneficiaries. Some CCS administrators who were interviewed as part of the study noted that the CCS program was increasingly known for its case management functions, and that the CCS program role could eventually evolve into a role of quality assurance and oversight for children with special health care needs. Some CCS administrators indicated that prepaid health plans potentially offered more flexibility for adopting policies and procedures in response to the carve-out. In several of the expansion counties, one or more administrators expressed the observation that the program had moved away from an initial somewhat "adversarial" relationship between one or more of the health plans and the CCS program. Some administrators reported that the combination of a carve-out with the entry of commercial health plans with a statewide presence was resulting in greater program standardization across the counties, in terms of medical eligibility and in terms of authorization for specific services. Finally, while beyond the scope of this study, CCS program administrators reported new, evolving challenges for the CCS program. Broader issues than the "case-finding" and expenditure effects are evident, such as the sustainability of specialty provider networks given low Medi-Cal payment rates and specialty care restrictions in the non-Medi-Cal commercial health care sector for children with special health care needs.

Policy Implications

For children in low-income families, there are many public programs for which case-finding and access to health care are important objectives. The evolution of Medicaid and Title V programs, among others, creates divided responsibility across public programs for meeting the medical care needs of children with special health care needs. The conversion of fee-for-service state Medicaid programs to managed care systems can affect the roles and responsibilities of each of these interdependent programs. Whether implemented for financial or access to care objectives, service carve-outs provide a potential mechanism for referring vulnerable children to the appropriate public program or service sector.

These findings indicate a substantial effect on case-finding where responsibility for services is divided across programs. In this study, new financial incentives for health plans and providers, and greater visibility of CCS eligibility in the provider community and even within some Medi-Cal field offices, appeared to increase referral to CCS and expand monthly claimant volume. Health plans and physicians alike were given a clear financial incentive to identify and refer CCS eligible children to the CCS program. Findings suggest that some children in the pre carve-out period who were CCS eligible were not referred or were not found to be eligible. While some of the change can likely be

attributed to the financial incentives for physicians and health plans, there are other explanations for the increased participation. Some services for CCS eligible children may have bypassed CCS and been authorized by Medi-Cal. There is some evidence that the managed care expansion and the CCS carve-out thereby stimulated statewide effects that extended to the non-expansion counties.

Increased case-finding may change the composition of program participants. If this occurs, then caseload projections and expectations of per child expenditure based on pre-intervention data many not reflect actual post-intervention experience. In this study, monthly expenditures per claimant fell across the post carve-out period. While there was a time trend of declining per child expenditures over the study period, it appeared that the carve-out increased monthly volume of children with lower expenditures. It suggests that the tightening of the authorization process with respect to CCS involvement brought lower intensity claimants into the system and also increased overall services authorized for known eligible. It appears that on average, these were lower intensity services.

It is important to note that California's carve-out policy did not directly impose a different delivery system for CCS services. Instead, it created a financial incentive for referral and for adherence to CCS program standards. This is in contrast to other carve-out arrangements that introduce a new health care management system (contractor) into the delivery system. It is not known whether children who were not referred to CCS prior to the carve-out saw providers and/or received care that met CCS program standards of care. To the extent that the provider or location of care changed for a child as a function of the carve-out, the primary mechanism was greater enforcement of pre-existing CCS standards. Participation of children in the new Medi-Cal managed care delivery system could have changed the primary care provider and the specialists that were accessible for the child beyond the CCS diagnosis and CCS involvement, for better or for worse. Prior to referral to CCS, only the contracted primary care and specialty providers within a given health plan's provider network are accessible to a child. Such access questions comprise an important area for future research but remain outside the scope of this study.

Whether quality of care was enhanced by the carve-out policy is not known. This study did not evaluate how service access and volume may have changed for children. The only finding that relates directly to quality stems from increased referral to CCS. Greater referral rates to CCS may increase children's access to appropriately trained providers in the most optimal settings available (as defined by CCS standards). Prior to the CCS carve-out, findings suggest that some eligible children were not referred to CCS, and CCS was unable to play a referral and case management role for such children. Of course, it is important to keep in mind that without the carve-out, health plans would have been responsible for authorizing and reimbursing CCS services. Thus a complete carve-out evaluation would need to account for how CCS services might have been delivered within a fully capitated system.

Another important policy finding is that the carve-out effects may have extended beyond the targeted group of beneficiaries. The carve-out appeared to enhance case-finding and CCS authorization roles for those child Medicaid beneficiaries who were not required to participate in managed care.

California's carve-out of CCS services from prepaid care increased the visibility of the CCS program to the provider community as well as within the Medi-Cal program. The carve-out enabled the CCS program to more fully identify their target population, and to become more involved in monitoring the health care received by eligible children. The fact that the carve-out policy preserved an independent authorization process that was external to the health plans also was reported as a positive outcome of the carve-out policy. Greater recognition of the CCS role in case management was reported by some program administrators to demonstrate the program's value for children with special health needs. The increased and regular contact between the prepaid health plans and the CCS program may also offer future opportunities for system improvement that extend beyond Medi-Cal managed care beneficiaries to commercially insured children with special health needs. Future oversight and quality assurance roles of the Title V program may be more productive under a carve-out than under a fully capitated system, to the extent that more eligible children are identified.

While California's carve-out policy and pre-carve-out case-finding patterns may not be replicated exactly in other states, features of the policy and its impact are relevant to Title V programs in other states and potentially to other publicly funded health programs for children. It is possible that in other states as well, some eligible children are not referred to the Title V program. Even though California requires such referral, this study suggests that a greater number of children—and/or a greater volume of services they received—were part of the CCS program after the carve-out incentive was put in place. There are a number of publicly funded health programs for children that are independent but require coordination with other programs—such as Medicaid and EPSDT, Title V, developmental services, and mental health—and these findings may be relevant to those programs. Such health programs also in many cases require coordination with commercial insurers and the medical care system for certain groups of children. These findings are directly applicable to non-CCS programs such as mental health that involve similar financial and organizational relationships. For example, California's carve-out of behavioral health services from prepaid health plan contracts requires coordination between the health plans and the public department that manages the carved-out services, with potential lack of clarity regarding responsibility for diagnoses that involve ambulatory services. Thus the interface along with the case-finding and cost-shifting incentives of California's CCS carve-out provide important findings for other programs and other states.

ACKNOWLEDGMENTS

CHAPTER 1—INTRODUCTION

Children in low-income families or who have high medical needs may receive health services from a range of publicly funded programs. The evolution of child health policy in the U.S. has created a set of separate programs that serve specific groups of children based on a combination of income level and health need (Schlesinger & Eisenberg 1990). As a consequence, the concept of service exclusions or "carve-outs" and the incentives they create should be a particular policy interest to policy-makers. State Medicaid agencies administer the largest publicly funded child health programs. Many states are following the lead of early implementing states such as California in expanding managed care as a new delivery system for Medicaid beneficiaries. In a 1998 national survey of 41 states that converted to Medicaid managed care systems, five (5) states reported carving-out from the medical managed care contracts (or having special arrangements for) Title V Children with Special Health Care Needs services (Holahan, Rangarajan, Schirmer 1999b). A total of 23 states had carved out behavioral health services. The questions of which populations should be offered optional participation, and what services should be included or excluded from the capitated managed care contracts, are now before policymakers in many states. An empirical basis can help inform current and future decisions.

The purpose of this study is to understand how a "carve-out" of specialty services during a Medicaid transition to managed care affects both identification of and expenditures for children with special health care needs. This chapter describes the rationale for studying California's carve-out policy and for understanding incentive effects generally. It outlines the study hypotheses and approach, and the study limitations along with directions for future research.

Changing Financial Incentives in the U.S. Health System

Efforts to align incentives in the U.S. health system to promote quality while containing health care costs have motivated a significant proportion of health services research. Many have noted the potential inefficiencies in delivery of health services generated by fee-for-service payment systems, as well as the potential disincentives to quality and appropriateness of care generated by fully capitated, prepaid payment systems (Iglehart 1983). The challenge of balancing different incentive systems is seen most clearly in health care for populations who are high users of medical care due to intensive medical need (Kronick, Zhou, Dreyfus 1995). For these populations, managed care policies such as "gatekeeping" and placing physicians at financial risk are a particular concern. The need to understand the impact of incentives for children with special health needs has been identified due to (1) their medical vulnerabilities, and (2) their dependence on complex publicly funded health programs, relative to other children and relative to adults (Simpson & Fraser 1999). Medicaid and Title V are examples of such programs. Children with special health needs (defined broadly) also are disproportionately from low-income families who may have particular difficulties navigating services when utilization barriers are placed in their way. As a result, publicly and commercially-driven policies that may cause only incremental changes in health care use for the general U.S.

population could cause more substantial changes in health care access for more vulnerable populations.

For these reasons, a number of policies have been adopted by health insurers and by public health care payers such as the Health Care Financing Administration (HCFA) to "manage" the incentives of prepayment. Examples of such policies include applying risk adjustment in health care reimbursement systems; promoting health care quality by monitoring key indicators (e.g., HEDIS) and beneficiary satisfaction (e.g., the Consumer Assessment of Health Plans (CAHPS); eliminating patient cost-sharing or physician financial risk for preventive care services; and employing specific service or population exclusions from prepayment.

California's Medicaid Managed Care Transition and Specialty Care "Carve-out"

This study uses data from California—a state that implemented Medicaid managed care earlier and more broadly than most other states—to understand the financial incentives of a "carve-out" payment system for children. In the 1990's, California initiated a phase-in of mandatory managed care—on a staged county-by-county basis—for many child Medicaid beneficiaries. California chose to require nearly all beneficiaries in certain aid categories to participate in the managed care expansion. More specifically, the children who were required to participate included those receiving welfare benefits or meeting general low-income Medicaid eligibility requirements. This included most child Medicaid beneficiaries who were eligible for the Social Security Act Title V (Part 2) Children with Special Health Care Needs program, due to having medical diagnoses such as spina bifida or cerebral palsy.

Concerns that access and quality of care could be jeopardized for this vulnerable group of children if providers were placed at financial risk for these services led to special legislation. The legislation was passed in 1994 as managed care implementation dates approached. The legislation was a policy compromise that subjected most children to the managed care requirement but did not extend capitation to Title V services. The objective was to remove Title V services from the financial risk of health plans and providers. The exclusion from capitation covered specialty services provided to children with Title V eligible medical diagnoses. Specifically, Medicaid services relating to an eligible medical diagnosis were excluded from the managed care contracts and continued to be reimbursed on a traditional fee-for-service basis. The child health program in California that authorized such services prior to and following the carve-out is called "California Children Services", or CCS.

Importance of California's Carve-out Experience for Other States and Child Health Programs

Several characteristics of California's managed care expansion raise important policy questions for California and other states. The difficulty in determining whether specific services are required exclusively for a particular diagnosis suggests that this mixed reimbursement policy could motivate cost-shifting from capitated care to the carved-out services. Because many states are using carve-outs in their Medicaid managed care expansions, it is important to understand the incentives that

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carve-outs create and their implications for costs and caseloads. Carve-outs may affect program costs, case-finding of children with special health needs, and the composition of caseloads in public programs such as Title V. Carve-outs of mental health services from Medicaid managed care contracts share some characteristics with the CCS carve-out policy. These shared characteristics include the new financial and organizational relationships as well as the potential for divided responsibility for services related to some diagnoses (e.g., attention deficit disorder). Thus results of this study will help Medicaid agencies to anticipate effects of their reimbursement policies for children with chronic conditions or disabilities, for total costs as well as for case finding. The study also will help policymakers understand the impact on (and the response of) public child health agencies under a managed care transition and carve-out policy.

Ensuring compliance with standards of care   Another important implication of carve-out impact is that CCS paneling requirements set qualifying standards for providers. These standards apply to physicians providing ambulatory services as well as to comprehensive hospital-based centers serving children with special health needs. Many children participating in California's Medicaid managed care plans in the late 1990's are under the care of a general practice or family practice physician rather than a pediatrician, for primary care services. Preserving the fee-for-service option only for providers who meet Title V qualifications may sustain if not enhance quality of care to the extent that it is influenced by physician training or by organizational characteristics of the health care setting as prescribed by CCS.

Accounting for caseload changes in evaluating managed care impact Understanding carve-out effects is important in evaluating costs and access following managed care conversions. A key question for Medicaid managed care evaluations is whether carve-outs allow costs to be shifted from the prepaid contracts to the fee-for-service portion of Medicaid. If the exclusion of specialty care for patients in mandated managed care causes a shift towards higher specialty expenditures, these carve-out effects should be considered when the effects of the managed care expansion for children with special health needs are evaluated.

Extending family needs assessment and oversight to children with special health needs   It also is important to know how carve-outs may affect public program participation. While unintended, the California carve-out may be an effective mechanism for motivating Title V case finding. Title V programs often provide access to "wrap-around" health services for children and their families. They can refer families to additional programs and services and directly provide administrative case management services. Title V programs also can help to ensure continuity of care when a child's health insurance arrangement changes, because case management services extend to child Medicaid beneficiaries as well as to some uninsured and some commercially insured children. Thus identification of the total target population is a key Title V function. Although states may not implement specific financing strategies solely for the purposes of case finding, these results could inform the issue of whether financial incentives affect the identification of children with special health needs, or a subset of children with specific diagnoses.

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Understanding unique features of carve-out impact involving public and private sectors
Studies of carve-outs that involve commercial managed care and public agencies also are useful in highlighting unique implementation issues. A public sector (such as Title V) carve-out shares some characteristics with commercial sector mental health care carve-outs, as in both cases there is an organization distinct from the fully at-risk prepaid health plan that is responsible for authorizing services. However, there may be unique aspects of a carve-out that occur in a public agency due to existence of a different incentive structure. Also, its financial risk situation may be qualitatively different than that of a commercial organization managing a carved-out benefit. This study complements research on mental health carve-outs that link commercial medical managed care with a publicly managed mental health benefit. While this study does not investigate these differences, the study focuses specifically on effects for a publicly managed benefit and thus should be directly interpretable by Medicaid agencies and policy makers.

Extending lessons from early implementing states to those states currently designing managed care expansions   Finally, California is a large, diverse state with generous income and medical diagnostic eligibility for Medicaid and Title V, and thus has a more adequate population size than many other states to test this study's hypotheses. While California's unique policy and CCS/Medi-Cal traditions may not generalize to all other states, the analytic approach and key findings should be relevant to other states. California also has a highly competitive managed care industry, and therefore the incentive effects of a carve-out would be more clearly observed than in other states. California's experience provides an opportunity to test these important hypotheses in the kind of managed care environment to which many other states are moving. California's carve-out is an example of a temporary policy imposed by special legislation. Having an empirical basis for future decision-making can help guide more permanent decisions about the payment policy.

Hypotheses for Carve-out Impact

When providers are placed at financial risk for medical care with specific services "carved out" from their risk, a financial incentive to shift costs to the carved-out services is created. Theoretically such a policy creates a financial incentive for the provider to refer children to the entity responsible for the carve-out services whenever eligibility is suspected. It also creates an incentive for identifying services as related to the qualifying diagnosis. Thus the CCS carve-out policy may affect both the volume of CCS participants and the volume of services identified as CCS-related.

The CCS carve-out design not only creates financial incentives but also introduces a new participant—the prepaid health plans—into the CCS referral process. Because the health plans generally bear some financial risk, they have the financial incentive as well as the administrative infrastructure to refer to CCS. On the provider side, it is expected that the referral process will be affected by physicians, hospitals, and the prepaid health plans. The perceived costs and benefits associated with making the CCS referrals are expected to drive the referral practices. On the fiscal agent side, the referral process is affected by Medi-Cal field offices and by the local CCS programs. State protocols and procedures and any local variations are expected to drive their behavior. Any

combination of referral and authorization practice patterns on the part of these different institutions could contribute to carve-out impact.

Caseloads and expenditures are expected to be dynamic in such a large state during a period of economic, welfare, and program changes. The magnitude of Medi-Cal program changes during the 1990's may have spillover effects from the targeted groups in managed care expansion counties to other groups and to other regions. However, the association between the pre and post carve-out periods in the expansion counties relative to the comparison counties may identify unique trends that are attributable to the carve-out. Increased program participation may also change the diagnostic profile and/or the average per claimant cost experience among CCS program participants.

Aim 1 Determine whether the financial incentives of a carve-out policy increase case-finding of children with Title V-eligible conditions.

The first aim of the research focuses on the financial incentive for "case finding" of children with CCS qualifying medical diagnoses that is imposed by the carve-out policy. California's CCS program has a case-finding mandate and mission. It traditionally has relied on physicians and hospitals for referrals of medically eligible children. The expansion and carve-out create a new risk arrangement for providers and introduces prepaid health plans into the referral, authorization, and payment process for services to child Medi-Cal beneficiaries. There is an opportunity to investigate whether the addition of a new financial incentive affects the proclivity of providers to refer child Medi-Cal beneficiaries to CCS. Increased program participation may also change the diagnostic profile of CCS program participants. It also may change the average cost experience per CCS claimant.

Hypothesis 1: The number of children with at least one CCS-authorized Medi-Cal claim will increase following the carve-out relative to the pre-carve-out period and to the pre and post carve-out periods for the comparison groups.

Hypothesis 2: The increased case-finding will cause a change in the distribution of qualifying CCS medical diagnoses among identified CCS eligible child Medi-Cal beneficiaries.

Aim 2 Determine whether carving out specialty services increases total fee-for-service CCS payments and total Medi-Cal payments.

The second aim of the research focuses on the financial incentive to identify more medical services as potentially related to a CCS qualifying medical diagnosis. Relative to a fully fee-for-service system, imposing prepayment for a scope of services would be expected to heighten sensitivity of those at financial risk to the potential for CCS program authorization. There is an opportunity to investigate whether the addition of a new financial incentive affects the proclivity of providers to identify more of the medical services they are providing as potentially related to a CCS qualifying medical diagnosis.

Hypothesis 3: Expenditures on FFS CCS specialty services will increase in the post-carve-out period.

Hypothesis 4: The increased case-finding will cause a change in the distribution of per CCS claimant expenditures. Mean monthly expenditures per claimant will be lower in the post-carve-out period relative to the pre-carve-out period, and/or relative to the comparison counties.

Study Design

It is important to outline the strengths of the study as well as its limitations. Greater detail is provided in Chapter 3. Use of multiple comparison groups to strengthen the study is described here, followed by key limitations of the study and directions for further research. These are provided to elucidate the scope of this research and to illustrate how additional research could build upon it to answer some key policy questions for children with special health care needs.

The study examines the relationship between managed care participation under a carve-out program and the volume of CCS claimants and total expenditures for CCS services. The quantitative component of this research is a panel study that compares CCS program outcomes across counties and managed care eligibility groups for a four year period. Comparison of those subjected to the managed care expansion to those exempted from mandatory participation can net out secular changes in estimating the specific policy effect. A pre-post policy comparison may not adequately capture cost and utilization trends that are unrelated to the policy being studied. The rapid changes underway in the health system are difficult to capture as "control variables" in a pre-post comparison, and other approaches are needed to account for these changes. Multiple comparison groups are used in this study to address the problem of heterogeneity in group and time effects.

Figure 1.1 – Managed care enrollment options in counties during Medi-Cal managed care expansion

	Pre carve-out	Post carve-out
Expansion counties (14)		
Beneficiaries in mandated aid categories	FFS *or* voluntary MC	MC plus carve-out [b]
Beneficiaries in non-mandated aid categories	FFS *or* voluntary MC	FFS *or* MC plus carve-out
Non-expansion counties (36)		
Same beneficiaries as mandated categories	FFS [a]	FFS [a]
Same beneficiaries as non-mandated categories	FFS [a]	FFS [a]

[a] Three counties had options for voluntary MC in the Pre period, and MC plus carve-out in Post period
[b] Mandated aid categories differ between the 12 "Two Plan" and the 2 "COHS" counties

The qualitative component of this research uses interviews with state and county CCS program administrators to clarify and interpret the carve-out policy's impact. Interviews were conducted with administrators from counties that provided diversity of county size and geography, as well as a mix of COHS and Two Plan model managed care counties.

Limitations, and Directions for Future Research

Given the complexity of the Medi-Cal and CCS programs, it is difficult to characterize all of the relevant population, service delivery, and program changes that could affect carve-out impact. It also would be useful for policy-makers to be able to distinguish between provider response and beneficiary/family response to prepayment incentives, and to understand how Title V agencies may respond over time to managed care expansions (such as changes to authorization patterns). A broader evaluation would be necessary to quantify these different responses and to attribute them to specific agents. Understanding the mechanisms that health plans use for case-finding could help Medicaid and Title V to anticipate referral volume changes for purposes of staffing and outreach. There are multiple commercial health plans operating in the different expansion counties. The limited degrees of freedom precludes quantitative analysis of how different commercial health plans may have responded to the carve-out and how any differences in response that did occur have affected the outcomes of the carve-out (e.g., claimant volume, total claimant expenditures).

The carve-out may have two effects that are difficult to capture in claims data but that are important nonetheless. One such effect is earlier identification of children who would otherwise have been identified as CCS-eligible at a later stage. Such a change in the timing of identification and referral may not cause a large sustained caseload increase over time, but it does constitute a significant carve-out effect in terms of (1) referral activity; (2) the ability of the CCS program to influence what provider(s) deliver diagnostic and initial treatment services; and (3) children's timely access to CCS case management and other services. A second such effect is the identification and referral of children who turn out not to have CCS-eligible medical diagnoses. If CCS does not authorize diagnostic or other services for such children, then there will be no observed effect in the claims data in terms of claimant volume or expenditures. However, there may be an effect of significant policy interest. The fact that the carve-out encouraged identification of children who have special health needs within health plans creates an opportunity to target this population for quality of care studies, access to care evaluations, and case management services, as well as other possible interventions.

There are some limitations to the generalizability of the study findings. The counties that were first to implement the carve-out and the managed care expansion were not selected randomly for early implementation. Instead, they were implemented early because they did not experience the scope of challenges and the resulting delays and start-up problems of larger counties such as Los Angeles. It is possible that counties such as Los Angeles in which the carve-out occurred late in the study period experienced different caseload and cost outcomes than those identified in the early months. More generally, the involvement of California's CCS program with authorizing fee-for-service Medi-

Cal claims means that the system studied here shares some but not all characteristics of traditional fee-for-service payment systems. Pre carve-out "circumvention" of the CCS program may be unique to California's Medicaid system. These results will need to be interpreted by policy makers with this delivery system feature in mind.

It is possible that whether or not overall costs and CCS program participation change in response to the carve-out, there may be an impact on access and quality of care. The research questions in this study focus on the cost and enrollment effects of a policy that places providers at risk for children's medical care, exempting services related to an identified medical diagnosis. No data are available on use of services provided within the capitated prepaid health plans. Consequently is not the intent of the study and is beyond the scope of these data to identify how total medical care utilization changed for children, if at all. Given the scope of changes underway, these are clearly issues deserving of study. A broader evaluation could address these questions as well as examine the role of the carve-out and the impact of commercial managed care in terms of specialty provider program participation and availability. This dissertation provides a foundation from which a broader evaluation could build.

Organization of the Dissertation

The following chapter reviews the literature on payment incentives with an emphasis on impact of managed care growth. The chapter also examines the literature on carve-out incentives and their impact in different delivery settings. The review provides a foundation for the study hypotheses about how the total number and type of children participating in CCS may change, and how expenditure patterns may change due to a cost-shifting effect. It also reviews the relevance of managed care arrangements for children with special health needs specifically and briefly reviews current research on Medicaid managed care impact for children with special health needs. Chapter 3 describes the evolution of Medicaid and Title V payment policies, and the origins and operational implications of the carve-out policy. With this foundation, Chapter 4 describes the design of the quantitative analysis of CCS program participation and expenditures, and the methods of the qualitative component of the study that focuses on CCS program administrator experiences with the carve-out impact. Chapter 5 examines carve-out impact on CCS program participation and on caseload composition as defined by diagnostic profile of monthly claimants. Chapter 6 examines carve-out impact on CCS expenditures. It evaluates whether expected monthly CCS expenditures per claimants, and expenditures by provider type, change with the carve-out. This provides insight into how the carve-out affected referral practices. Chapter 7 describes the findings from interviews with state and county CCS program administrators about carve-out impact, including the specific mechanisms for change and their observations of post carve-out roles for CCS. Chapter 8 integrates the findings and discusses the policy implications for publicly funded child health programs in California and in other states.

CHAPTER 2—BACKGROUND ON PAYMENT INCENTIVES AND CARVE-OUTS

This chapter discusses the carve-out concept and its theoretical effects for service use and costs, and summarizes the key literature on carve-outs and a more general literature on provider responses to payment incentives. The chapter begins with an overview of policy objectives in carve-out initiatives. This is followed by a brief review of approaches to and results from evaluating provider response to financial incentives. Attention to methodologies employed is included. A discussion of roles and impact for public agencies involved in a carve-out policy is then provided. This is followed by an overview of evaluations undertaken in Medicaid program or other public program carve-out policies. Specific areas in which studies are needed to understand incentive impact also are discussed.

2.1   Financial Incentives and Use of Carve-out Arrangements

This section reviews the relevant literature on provider response to incentives, examines what is known about provider cost-shifting in managed care, and synthesizes the limitations of the existing literature for answering the primary policy questions that are the focus of this study.

Policy Objectives of Service Carve-Outs

The rationale for excluding specific services or health insurance benefits—such as mental health services—from prepaid health plan contracts has been primarily to manage the moral hazard of insuring specific services by having specialists manage those benefits (Frank, Huskamp, McGuire et al 1996). Exclusions from mainstream prepaid health plan contracts of services or of particular populations, such as Medicaid beneficiaries with diagnoses requiring intensive, expensive medical care, are thought to reduce health plan incentives to compete on patient risk (Glied 1998). Typically these exclusions, termed "carve-outs", are managed separately from other medical care, and have distinct budget, and distinct provider networks and incentive arrangements (Frank, McGuire, Newhouse 1995).

Survey results reported by Hodgkin, Horgan, and Garnick (1997) indicated that in 1989, 54 percent of commercial managed care organizations used separate contractors to provide behavioral health services. Grazier and Eselius (1999) report on key objectives of carve-out arrangements for mental health services. They report that cost objectives are coupled with access concerns with a special interest in the parity of mental health and medical care increases. Often payers are looking for the most cost-effective alternative, and this may mean using a specialty MCO for the mental health benefit. These authors excluded from their review some evaluations of carve-outs that had divided benefits.

A 1997 study (Brisson, Frank, Notman et al) of a behavioral health carve-out with a national managed care organization highlights the outcomes of interest in a specialized managed care carve-out, and underscores some of the differences between expected outcomes in such an arrangement and

the possible expected outcomes in a publicly managed service carve-out. It also highlights the outcome commonly studied in such carve-outs, which is utilization of the carved-out services.

Implementation of service exclusions in many State Medicaid programs in the 1990's provides a unique opportunity to evaluate effects of such exclusions on health care costs. It has been observed that carve-out policies can limit biased selection (resulting from health plan competition to reduce enrollment of higher cost individuals) but in other cases are adopted to take advantage of the specialization in managing certain services that a specialized managed care organization can provide (Brisson, Frank, Notman et al 1997). With respect to possible selection effects, service exclusion policies are currently attractive to many states because the field of pediatric risk adjustment for aligning incentives is only in early stages. This is in part because the children who would most benefit (those at risk for high costs due to complex medical conditions) are small in number, but have a very diverse set of diagnoses and unpredictable costs that do not lend themselves easily to expected-cost-based risk adjustment systems (Andrews, Anderson, Han et al 1997; Ireys, Anderson, Shaffer et al 1997; Fowler & Anderson 1995). Also, the impact of misaligned incentives on children's access to care and on their health outcomes may be significant, long-term, and politically sensitive.

A policy compromise that may achieve the best of fee-for-service and of prepaid health care involves transforming payment policies into mixed managed care and fee-for-service systems (Glied 1998). Such an arrangement embodies aspects of a carve-out policy by placing an organization at financial risk for some services but handling other services sensitive to selection or underutilization problems under a different financial arrangement. Investigation of how well such mixed policies function in practice is deserving of study because of the significant implications for overall costs and efficiency.

Most published studies on this topic focus on carve-outs and exclusions that create distinct, prepaid contracts for specific services. These carve-outs exclude all services of a particular type; in contrast, the California policy excludes services only when they are specifically required for certain underlying diagnoses.

Provider Response to Financial Incentives

There is a substantial literature on how providers respond to reimbursement changes. The economics of provider behavior—whether the hospital or the physician—generally focuses on the medical care provider as an income maximizer. Some studies of physician behavior suggest that physicians respond to changes in relative pricing of services (by large payers such as HCFA) generally by increasing or decreasing the provision of specific types of services (Gruber & Owings 1996; McGuire & Pauly 1991; Rice & Labelle 1989; Reinhardt 1985). Several studies on physician incentives under price ceilings identify a tendency for physicians to increase the total volume of claims, which has been termed a "volume offset" effect (Barer, Evans, Labelle 1988; Reinhardt 1985). "Volume offset" behavior would enable a physician to maintain a certain income level given

the price constraint. A number of studies have sought to quantify physician response to relative price changes (Escarce 1993; Christensen 1992).

A number of studies examine whether or not providers respond to price limits or prepaid contracting by increasing charges to other patients. Studies of hospital responses to financial incentives find that exogenous changes such as Medicaid reimbursement reductions, or an increased share of prepaid patients in a hospital population, can result in some costs being shifted to other types of patients (Foster 1985; Hay 1983; Danzon 1982). Numerous studies find strong effects of prospective payment incentives for physicians and hospitals, sometimes reducing total services and sometimes resulting in apparent "quality" changes to attract more profitable patients (Ellis & McGuire 1996; Ellis & McGuire 1993; Dranove 1987).

Other possible explanations for how incentives could drive a carve-out effect have been offered. For example, Gruber & Poterba (1994) refer to "recognition effects" in which implementation of a policy causes the relevant actors to alter their behavior based on new perceptions. Thus it can be the simple implementation of a policy, rather than its magnitude, that causes the impact.

Other studies examine the presence or magnitude of response when mixed financing arrangements are used to compensate providers for the care of a patient. Providers may respond when the individual receives care from more than one provider, institution, or payer, and when responsibilities for care are difficult to clearly define among providers. This may be particularly likely to occur for children with complex medical conditions, because of the inherent difficulty of dividing responsibility for their care. This type of payment response has been described as a moral hazard effect of payment incentives, and has been labeled more specifically a "claims reporting" type of moral hazard by Butler, Hartwig, Gardner (1997).

Children with CCS eligble diagnoses often receive services from multiple programs and providers. Studies of workers' compensation patterns linked to regional HMO penetration rates provide a conceptual and methodological foundation for examining carve-outs for children. Butler et al. examined the association between growth in workers compensation claims and HMO penetration in health care markets. The workers compensation case is somewhat analogous to a Medicaid service carve-out. State laws require fee-for-service indemnity payment for workers compensation injuries; at the same time, medical benefits of workers can be prepaid or fee-for-service, depending on the worker's selection of a health insurance benefit. The authors examined the association between HMO penetration, and claimants' insurance type, on both the frequency and the severity of workers compensation claims.

A methodological difference between workers' compensation studies and the analysis of the CCS carve-out policy is that costs per episode can be evaluated for such studies. Also, the policy implications of cost-shifting are somewhat different in the workers compensation example than in a Medicaid service carve-out situation. In the workers' compensation example, costs were shifted to a different financing source when changes occurred in a separate market (the commercial health insurance industry). Personal medical costs were shifted to workers compensation funds. In a

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Medicaid service carve-out, costs are more likely to simply be shifted from one stream of Medicaid funds to another, rather than from one payer to another. However, similar implications hold in the workers compensation and the Medicaid carve-out examples. One effect is to drive up costs in one funding stream while another sector—prepaid health plans—may achieve higher profits while appearing to achieve cost savings. A second potential effect is to increase the number of individuals filing at least one claim, which in the Medicaid case would translate to increased case-finding of children with Title V-eligible conditions.

Other studies have evaluated health plan "learning curves" following implementation of carve-out payment policies. Sturm (1999) used several measures to evaluate whether effects of behavioral health carve-out policies manifest not immediately but over time. Reasons to expect that experience over time could matter include network maturation; improvement in care management procedures; and improved monitoring policies and procedures that can lead to greater carve-out response over time (Sturm 1999). This study examined annual data for 52 managed behavioral health plans in 14 states that implemented between 1991 and 1996. Measures whose association with carve-out service costs were examined included (1) time since plan implementation, to capture plan-specific organization learning; (2) volume of claims in the plan's primary state, to capture provider (network) maturation affecting all plans in a particular region; and (3) cumulative volume of claims processed by the plans' management company, to capture experience.

2.2   Evaluations of Managed Care and Service Exclusions

This section reviews the results of several studies in workers compensation, in commercial health insurance arrangements (behavioral health services), and also in Medicaid managed care expansions. It also identifies the special relevance of the carve-out mechanism and payment incentives for services to children with special health care needs.

In their workers compensation study, Butler et al. found that an eight percent increase in the HMO covered population would have increased the number of claims by 19 percent, and would increase average medical costs by 10 percent more than average indemnity costs (Butler et al. 1997). These authors also used data from a single firm operating in all 50 states to better control for occupational differences and possible changes in employee benefits over the study period. These data were evaluated to determine how state-level HMO participation rates affected individual-level costs and frequency of work-related episodes. The frequency of claims was found to be higher for patients visiting HMO providers and was consistent with findings from the earlier study. Medical costs per claim for workers compensation patients visiting HMO physicians were found to be slightly lower than costs for those visiting fee-for-service physicians, suggesting that workers with HMO coverage have a higher frequency of claims but that the average severity or cost of the claim is relatively low. The authors suggest that both the reporting of problems as work-related, and the frequency of work-related claims once reported, increased with HMO penetration and with workers' enrollment in HMOs. Butler et al cite an earlier study of workers' compensation costs, which studied workers compensation claims for federal civilian employees working at eight shipyards, and found that areas

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in which more workers were enrolled in HMOs also had higher average workers' compensation costs (Ducatman 1986).

A 1997 study (Brisson, Frank, Notman et al) of a behavioral health carve-out with a national managed care organization highlights the outcomes of interest in a specialized managed care carve-out, and underscores some of the differences between expected outcomes in such an arrangement and the possible expected outcomes in a publicly managed service carve-out. It also highlights the outcome commonly studied in such carve-outs, which is utilization of the carved-out services. This study examined utilization of the services for a continuously enrolled population for periods prior to and following implementation of the behavioral health carve-out. The change in the contractor was accompanied by a change to the financial risk arrangement; the new contractor was at risk for inpatient services, while in the previous contract the inpatient stays were paid to hospitals by the health plan on a fee-for-service basis. The authors found that utilization of inpatient services declined, as did total expenditures per enrollee and the likelihood of an enrollee using any service within the carved-out benefit (Brisson, Frank, Notman et al 1997). Expenditures among those receiving only outpatient services declined by 35 percent. In this specialized managed carve-out, there was an incentive to reduce utilization and expenditures for the carved-out benefit.

A 1998 study by Ma and McGuire examined costs and use in a carve-out program for mental health care among privately insured individuals. The purpose of this study was to determine how incentives within the service carve-out were associated with the use and costs of services. (As noted in Huskamp (1999), benefits were also increased as part of the implementation, particularly for in-network outpatient care). The authors note that a "ratchet effect" was also put into place, in which reduction in expenditures would result in lower future rates paid to the contracting organization. The authors also note that the contractor might want to demonstrate good performance in the first year. This study did not evaluate cost-shifting between the carved-out mental health benefit and the medical plan, although the authors note the possibility. The authors report a nominal decline in costs (50 to 60 percent) in the two post implementation years. The impact was further adjusted for possible changes to case-mix by selecting only those continuously eligible. This study used a group of enrollees who were continuously enrolled for a four-year period to compare cost outcomes in the pre and post carve-out periods. Authors also adjusted for medical price changes by using the medical care component of the Consumer Price Index (CPI). Regression was used to account for an independent time trend for the continuous eligibles. It was not clear that the downward trend in the pre implementation period would have continued, and that there was an appropriate counterfactual. Thus the authors note that they may overstate the independent trend. Overall, the authors conclude that the minimum estimate of the carve-out effect was a 30 to 40 percent change. There was a more substantial decline in inpatient expenditures than in outpatient expenditures.

The expectation of relatively constant chronicity and health need is likely to be less appropriate in children than in adults. Few children with complex medical diagnoses can serve as their own "controls" in a pre-post policy evaluation. This underscores the importance of having an adequate control group as well as a pre-post comparison.

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Another evaluation of managed care in Massachusetts focused on a behavioral health carve-out for state employees (Huskamp 1999). In this implementation, the transition changed not only the financial incentives but also the benefit administration, procedures, service benefits, and the preferred site of care. This study examined the probability of any use of care among eligibles along with the site of care, expenditures per episode, and effects for individuals receiving care for specific diagnoses. This study also did not have pharmacy data available for evaluation.

Use of Carve-Out Policies in Medicaid Managed Care Transitions

State Medicaid agencies have used different types of "carve-outs" in administering their managed care systems. Some Medicaid carve-outs are service-based (such as mental/behavioral health care), while others are population-based (such as children receiving SSI), or disease-specific (such as HIV-related care, diabetes care) (Medstat 1997; Fox, Wicks, Newacheck 1993).

Published studies on service carve-outs for children are scarce. Several studies have been conducted on the effects of mental health care carve-outs in state Medicaid programs. While the structure of these carve-outs is not identical to California's carve-out policy, the methodological approaches of these studies are relevant to the study design.

Burns et al (1999) evaluated the impact of a managed care pilot in North Carolina. This pilot was implemented in the 10 of 40 local mental health program areas in the state that had the highest historical inpatient costs. Initially these local programs were placed at risk only for inpatient mental health services, and two years later the risk arrangement was extended to full risk for all mental health services. The rate of service use among children increased after the publicly managed capitated Medicaid mental health program was implemented in the pilot counties. However, rates of service use also increased in the non-pilot counties. Authors speculated that this was due to anticipation of a statewide expansion of the risk arrangements. Inpatient expenditures declined to 50.1 percent of the pre-pilot amounts in the pilot counties while increasing by 3.3 percent in the non-pilot counties. Outpatient expenditures increased 21.3 percent of the pre-pilot amounts and increased by another 32.5 percent of the pre-pilot amounts by the last year reported. In total, the increase was 53 percent of the original amounts. For the non-pilot areas, outpatient service expenditures declined from 21.0 percent to 14.7 percent.

These studies also highlight several methodological challenges for studying service carve-outs for chronically ill children: identifying an appropriate control group, studying a representative group of beneficiaries, and discerning effects for beneficiaries who have different underlying levels of medical need.

Callahan (1995) evaluated the MHSA carve-out in the Massachusetts Medicaid program. This study found an increase in the proportion of beneficiaries receiving outpatient services. Overall users increased by 5 percent. Total services per beneficiary declined, as did inpatient services. Of the 13 service types, increased use was found for six types, and lower use was found for seven.

Dickey (1995) examined the same population. As in Callahan (1995), the volume of individuals treated was found to increase. The effect was due to an increase in outpatient services, as inpatient services had declined. Dickey (1996) found that for those with schizophrenia, in the first post carve-out year compared to the previous year, there was a 46 percent increase in the number of individuals treated. There was a 3 percent increase in the second year. Inpatient services declined 52 percent in the first year but only 15 percent in the second year.

Norton, Lindrooth, and Dickey (1996, 1997a) report other findings on use of mental health services following the managed care expansion. The authors found that cost-shifting from the managed care contractor to the Medicaid program was higher for enrolled beneficiaries in the top quartile of total per beneficiary expenditures (Norton, Lindrooth, Dickey 1997a). In a subsequent study of Medicaid/AFDC enrolled children and adults (1997b), the authors examined total public expenditures and also compared psychiatric and non-psychiatric utilization to assess cost-shifting. The authors found little change in utilization for the AFDC-eligible population, attributing the lack of an effect to the low utilization of AFDC beneficiaries of mental health services. They contrast this finding with the more significant effect identified for adult beneficiaries eligible for Medicaid due to disability from a severe mental health problem.

Because HMO enrollment was voluntary in this study, the enrolled population was not necessarily representative of the total population. Further, this study did not have a control group that was not subject to the carve-out. However, the authors were able to compare their results with a study of a different population—a private sector study of inpatient and outpatient utilization trends in the same state.

Christianson (1995) found that in the Utah Medicaid program, inpatient use declined 17 percent in the implementation areas in the first year, but no changes in outpatient or emergency department services were found. Stoner (1997) studied the same population for 3.5 years and found that the hospitalization differences dissipated.

2.3 Carve-Out Roles and Impact on Public Health Agencies

Gold (1999, HSR) has observed that Medicaid managed care transitions are complex and that absent unique operational details of a state's transition, inference about program impact may be inaccurate. Effective description of implementation, of trends over time on performance measures, and design options are identified as analyses that are most needed by state policy-makers (Gold, 1999 HSR).

State Medicaid programs and Title V programs serve a traditional "safety net" role for low income and chronically ill people—especially for children, who are the largest group of beneficiaries. Thus they have a particularly vital policy interest in the effects of new financial incentives and have monitoring responsibilities. States also continue to have public health responsibilities for policy development, assessment, and assurance, as well as the Medicaid mandate to assure health care access for many low-income and chronically ill beneficiaries. Thus these new payment systems, which include privatization, mean that state agencies are moving away from providing medical care

and have the opportunity to oversee how care is provided and to focus on population needs and health outcomes. The focus on oversight enables an agency to attend to operational details that enhance or detract from performance objectives.

At the same time, State agencies have important roles and responsibilities that pertain to the implementation of service carve-outs. Thus Title V agencies in particular have continuing and emerging roles in terms of public-private relationships, specifically with the providers and managed care organizations that are involved with the carve-out program.

Policy questions of interest to Medicaid and Title V agencies that are preparing to convert their systems include what public agencies that have administered in carve-out programs to date have done to make the transition to a new public-private relationship work, and what issues have been encountered. Specific questions that are relevant include how public agency-managed care organization disputes about coverage are resolved; what types of policies and procedures the public agencies can put in place to track the services children receive and their access to needed medical services; what changes this requires in terms of how staff roles change; and what knowledge and information/data are needed by agency staff to carry out these roles successfully.

Summary

A 1999 study by Gold examined how characteristics of a state's transition to Medicaid managed care appeared to correspond to Medicaid beneficiaries' self-reported experiences with health care access. This approach underscores the potential importance of the transition for beneficiary and provider experiences.

As noted earlier, the 1998 national survey of state Medicaid program financing policies under managed care found that states were implementing a variety of mandates, exclusions, and carve-outs (Holahan, Rangarajan & Schirmer 1999a). This survey included responses from 41 of 45 states deemed to have capitated Medicaid managed care programs. Only 5 states reported carving-out services provided to children with special health needs (Holahan, Rangarajan, Schirmer 1999b). The authors reported that interviews with state administrators identified different approaches in use, such as managed care exclusions for Title V eligibles, and choices between managed care and a limited risk primary care case management (PCCM) arrangement. Among these 41 states, a total of 23 reported full or partial carve-outs of mental health services while 20 states reported full or partial carve-outs of substance abuse services and 8 reported full or partial carve-outs for HIV/AIDS related services (Holahan, Rangarajan & Schirmer 1999a). The authors reported that public agencies administer the carved-out behavioral health benefit in some states while private sector organizations administer the carve-out in other states, but did not report the frequency of each type of arrangement.

In summary, there is evidence that managed care penetration rates within the commercial health care sector can induce provider behavior in terms of classifying care as relating to non-capitated diagnoses or services. Reimbursement arrangements that carve-out specific services from medical

care contracts have been found to affect volume of health care recipients as well as the intensity of services provided. A number of these studies focus on carve-outs that involve multiple commercial managed care organizations rather than a combination of commercial and public institutions managing different services within the insurance benefit. Several have focused on commercial managed care organizations with a behavioral health benefit managed by a public agency. The fact that there are numerous and complex public programs that serve children, and children in low-income families in particular, means that the concept of a service carve-out and its incentive effects can generalize to more child health programs than Title V. Experiences with implementation and impact on key program objectives thus provides useful information for states designing Medicaid managed care systems and may also be applicable to financing arrangements for other child health programs.

CHAPTER 3—BACKGROUND TO THE POLICY EVALUATION

This study examines the impact of a payment policy that was adopted by California's Medicaid program to reimburse Title V services within a managed care delivery system. This chapter describes the evolution of Medicaid and Title V payment policies in California. It describes the Title V program, Medi-Cal payment policies, key elements of California's transition to Medicaid managed care, and the origins and implementation of the Title V carve-out.

Introduction to Medicaid and CCS

In 1927, California enacted the Crippled Children's Services Act in response to the perceived unmet needs of children whose physical disabilities could be surgically repaired (CMS, 1996). Federal legislation several years later created a federal funding mechanism for such programs in all states. Title V (Part 2) of the Social Security Act was adopted in 1935 to provide medical care to children with physically disabling medical diagnoses. The resulting Services for Crippled Children program, re-named as the Program for Children with Special Health Care Needs in the 1980's (Ireys & Eichler, 1988), thus preceded the Medicaid program by 30 years. The purpose of Title V, Part 2 was to ensure access to medical care for children with disabling diagnoses who might otherwise not receive adequate treatment, and thereby prevent or ameliorate handicapping conditions.[2] Title V called for a comprehensive service system to include case-finding, treatment, and follow-up services (Shonkoff & Meisels, 1990). States were given the authority to define the diagnoses that would confer medical eligibility. Most states initially focused on orthopedic problems but extended eligibility for medical illnesses (Ireys & Eichler, 1988) as the program and medical technology evolved.

Until 1965, state programs established under Title V, Part 2 directly provided services or reimbursed these services, or served as both a provider and a payer of specialty services. The Social Security Act was further amended in 1965 to include Title XIX, which established Medicaid as an optional, state-administered medical assistance program that received federal matching funds. Medicaid provided a new source of medical care funding for children in low-income families. The Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program was adopted several years later to mandate early identification and treatment of health conditions for children 0-21 years of age who were Medicaid beneficiaries.[3] State Title V programs have continued to directly fund

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[2] Title V programs of Maternal and Child Health Services (Part 1), Services for Crippled Children (Part 2), and Child Welfare Services (Part 3) were incorporated in 1981 into the Maternal and Child Health Block Grant to states. As clarified in this chapter, the block grant funding mechanism does not affect the funding stream for most services to children who are dually Medicaid and Title V eligible, because their medical care is paid by Medicaid (an entitlement program). The block grant funding does affect funds available to the states for Title V eligible children who are not Medicaid eligible, and it also affects funds available for the administrative and case management functions of Title V programs that are not direct medical services.

[3] The EPSDT program created an entitlement for child Medicaid beneficiaries age 0-21 years to "any service which the state is permitted to cover under Medicaid that is necessary to treat or ameliorate a

medical services for medically eligible children who do not meet Medicaid financial eligibility requirements.

In California, the evolution of Medicaid ("Medi-Cal") and Title V required a working relationship between these two important health programs for low-income children. These means-tested, publicly funded health programs have overlapping income eligibility criteria. The Medi-Cal program targets low-income children, and the Title V program also serves low-income children but extends its services to higher income families whose child incurs substantial medical expenditures. As detailed in the following sections, California children who are eligible for both Medi-Cal and Title V programs have their medical services paid by Medi-Cal but authorized by Title V. California administers the Title V, Part 2 provisions within the State Department of Health Services in a program called California Children Services (CCS).

3.1 Description of California's Title V Program for Children with Special Health Care Needs

Annually approximately 140,000 children participate in the CCS program (CMS 1996). Child Medi-Cal beneficiaries (age 0 to 21 years) who receive services from CCS comprise a small percentage of children in Medi-Cal. The number of child Medi-Cal beneficiaries receiving CCS-authorized services during the calendar years of 1994 through 1997 were as follows: 66,497 (1994); 69,807 (1995); 73,167 (1996); and 77,602 (1997). These children comprise an even smaller proportion of Medi-Cal beneficiaries of all ages, which averaged 5.1 million individuals monthly in 1997 (SDHS MCSS 1997). Despite the relatively small number of children, total annual expenditures for children with CCS diagnoses are significant. In calendar year 1997, approximately $564.9 million in Medi-Cal funds were expended on CCS specialty services for child Medi-Cal beneficiaries. These expenditures are part of a total of $10 billion that was expended on fee-for-service Medi-Cal in calendar year 1997; an additional $2 billion was expended on prepaid county-organized systems (COHS) and prepaid health plan payments in 1997 (SDHS MCSS 1997).

Enabling Legislation and Program Regulations

Title V, Part 2, of the Social Security Act contains a provision for the appropriation and allocation of federal funds to states, to serve children with physically disabling medical conditions. The Social Security Act requires state health departments to directly administer the Title V program for children or to supervise a locally administered program; specific regulations are contained in the Code of Federal Regulations, Volume 42. California's Title V Children with Special Health Care Needs program (California Children Services, or CCS) is administered by the California State Department of Health Services (SDHS), and within the Maternal and Child Health Branch of SDHS. Title 22 of California's Administrative Code (Section 51013) "provides that any patient under age 21 certified as eligible for Medi-Cal who has a condition eligible under CCS shall be referred to the

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defect of physician and mental illness, or a condition identified by an EPSDT screening exam....even if the State does not normally include that service as a benefit of the State's Medicaid plan" (HCFA 1993). At least on paper, the EPSDT program thereby extends broad medical benefits to children.

CCS agency for case management services and prior authorization" (SDHS 1979). California's Code states that it will "establish and administer a program of services for physically defective or handicapped persons under the age of 21 years...for the purpose of developing, extending and improving such services" (SDHS 1979).

CCS is a medical program that includes financial as well as medical qualifying components. Children who are Medi-Cal beneficiaries are automatically financially eligible. California's program uses a combination of state and county funds to fund medical care for (1) low-income, uninsured children; (2) children who are insured but have gaps in service coverage (e.g., limitations to the type or volume of benefits available under their health insurance plan); and (3) children whose annual medical expenses exceed a threshold percentage of household income.[4] CCS income eligibility is associated with an established annual income level rather than with a multiple of the federal poverty level (FPL) adjusted for family size, as used by the Medicaid program.

Identification of CCS eligible children is a continuing mission of the county CCS programs, as outlined in Medi-Cal and CCS manuals and in California code. With respect to case finding and reporting, California code states that counties "shall conduct an active and continuous program of case finding of all persons under 21 years of age who are suffering from handicapping conditions. This function may be carried out by physicians and health and welfare agencies, public and voluntary. All cases in need of CCS services shall be referred to the local agency within the county which is administratively responsible for the program" (Section 2900, Title 17, Administrative Code; State Department of Health Services, 1979). The Medi-Cal Provider Manual (2000) specifies that CCS referral is required by law. According to the manual, all Medicaid beneficiaries "under 21 years of age who are residentially, financially and medically eligible for CCS diagnostic, treatment and therapy services are required by law to be referred to the CCS program for case management."

CCS Program Functions

The Title V program mission extends beyond payment functions to system development and assurance objectives. Pursuant to this mission, the CCS program credentials ("panels") physicians and hospitals as providers of CCS services; supports a system of facilities that are held to certain structural standards (e.g., staffing requirements, multidisciplinary team participation in treatment plans); provides administrative case management services to children and their families; provides a

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[4] Children who are not Medicaid beneficiaries are income-eligible if they are from families with annual incomes below $40,000 (unadjusted for family composition and size) or have annual medical expenditures that exceed 20 percent of their family's total income (CMS, 1996). Children who are full scope Medicaid beneficiaries receive all CCS services free of charge. On September 1, 1991, an enrollment fee was put in place as an annual CCS program fee for other participants. This fee is based on a sliding scale relative to the federal poverty level (FPL) and is waived for families if (1) their income is below 200 percent of the FPL; (2) the child is eligible for full scope (i.e., non-restricted) Medi-Cal benefits without a share of cost; (3) the only service requested is a diagnostic service to determine medical eligibility for CCS; or (4) the only service requested is for school-based Medical Treatment Unit (MTU) services.

payment authorization function for Medicaid-eligible children; and directly pays for services for medically and income eligible children who do not qualify for Medicaid.

According to CCS regulations, services authorized by CCS are to be delivered by recognized providers who meet specific requirements. For physician paneling, CMS requires written certification of medical licensing and board certification. Non-paneled physicians can provide services to CCS eligible children in some cases if the provider is in a category that is not covered by CCS standards for participation and/or when it is determined that they meet agency standards (SDHS 1978; 1991). Specifically, regulations permit authorization to be issued to a non-paneled family physician or general practitioner "for services delegated or shared by the authorized panel physician" (SDHS 1979).

For hospital facility paneling, CMS requires that most facilities meet a set of structural standards including medical staffing, physical plant, nursing service, and social work requirements, among others. CCS approval of hospitals includes four types of approvals: (1) limited approval for a hospital in a rural area that can provide specific services for a certain age group, not to exceed five days; (2) standard approval for a community hospital capable of providing intermediate care for a period not to exceed 21 days; (3) long term approval for a referral hospital that provides tertiary level care that can exceed 21 days (covering teaching hospitals and their major affiliates with approved residency programs); and (4) special approval for hospitals providing services to adolescents that do not have a pediatric service (SDHS, 1978). Because of the variability in health system capacity across the counties, there is some variation in the level of structural standards that paneled facilities may meet. Thus a specialty center in Los Angeles may have staffing levels of social workers and other support staff that a smaller, rural county might not have. Finally, hospitals may be paneled for certain diagnoses but not for others, based on their staffing and physical capacity.

Medically Qualifying Diagnoses and Determination of Eligibility

The scope of eligible conditions in California is generous relative to counterpart programs in other states, covering illnesses such as cancer in additional to the physically disabling conditions that all states cover (Maternal and Child Health Bureau 1997; Ireys, Hauck, Perrin 1985). Not all chronic or high cost medical conditions that a child may have are CCS-eligible; for example, most children with diabetes or asthma are not eligible, and services for injuries or diseases that may not produce long-term disability are generally not CCS-eligible. A summary of medical eligibility for CCS is provided in **Table 3.1, Overview of California Children Services (CCS) medical eligibility**. The classifications of qualifying medical diagnoses are illustrated in **Table 3.1**. The most common CCS medically eligible diagnoses statewide among those receiving CCS services, as identified by Children's Medical Services (using SDHS claims data) for the calendar year 1995, are identified in **Table 3.2, Most common medically eligible diagnoses among Medi-Cal enrollees receiving CCS services (1995)**.

Table 3.1 – Overview of California Children Services (CCS) medical eligibility

Infectious and Parasitic Diseases (ICD-9 000-139)
Generally eligible when they involve the CNS and produce disabilities requiring surgical and/or rehabilitation services; involve bone; involve eyes, may lead to blindness and are a medically treatable condition; are congenitally acquired which may result in physical disability, and for which postnatal treatment is available and appropriate
Neoplasms (ICD-9 140-239)
All malignant neoplasms; benign neoplasms when they constitute a significant disability or significantly interfere with function
Endocrine, Nutritional, and Metabolic Diseases (ICD-9 240-279)
Generally eligible, including cystic fibrosis, inborn errors of metabolism; includes diabetes mellitus when it is uncontrolled (per CCS criteria) and/or complications are present
Diseases of Blood and Blood-Forming Organs (ICD-9 280-289)
Generally eligible, including sickle cell anemia, hemophilia and aplastic anemia, iron or vitamin deficiencies when life-threatening complications
Mental Disorders (ICD-9 290-319)
Only eligible when associated with or complicates an existing CCS-eligible condition (limited diagnosis and treatment under these conditions)
Diseases of the Nervous System and Sense Organs (ICD-9 320-359)
Generally eligible when they produce physical disability that significantly impair daily function; idiopathic epilepsy when seizures are uncontrolled (per CCS criteria); treatment of seizures due to underlying organic disease is based on eligibility of the underlying disease
Sense Organs (ICD-9 360-389)
Strabismus when surgery required; chronic infections or disease of the eye when may produce visual impairment or require complex management or surgery; hearing loss (per CCS criteria), perforation of the tympanic membrane requiring tympanoplasty, mastoiditis, cholesteatoma
Diseases of the Circulatory System (ICD-9 390-459)
Generally eligible, including conditions involving the heart, blood vessels, lymphatic system
Diseases of the Respiratory System (ICD-9 460-519)
Upper respiratory tract conditions if they are chronic, cause significant disability and obstruction, or complicate the management of a CCS-eligible condition; chronic pulmonary disease (per CCS criteria)
Diseases of the Digestive System (ICD-9 520-579)
Diseases of the liver, chronic inflammatory disease and congenital abnormalities of the GI system, gastroesophageal reflux (per CCS criteria), malocclusion when severe impairment of occlusal function (per CCS criteria)
Diseases of the Genitourinary System (ICD-9 580-629)
Chronic genitourinary conditions and renal failure; acute conditions when complications are present
Complications of Pregnancy, Childbirth, and Puerperium (ICD-9 630-678)
Prenatal care and delivery if the pregnancy complicates the management of the CCS-eligible condition (e.g., cystic fibrosis, diabetes, chronic renal or cardiac disease)
Disease of the Skin and Subcutaneous Tissue (ICD-9 680-709)
Eligible if disfiguring, disabling and require plastic or reconstructive surgery or prolonged and frequent hospitalization
Disease of the Musculoskeletal System and Connective Tissue (ICD-9 710-739)
Eligible if disabling
Congenital Anomalies (ICD-9 740-759)
Eligible if disabling or disfiguring, amenable to correction and requires surgery

Certain Causes of Perinatal Morbidity and Mortality (ICD-9 760-779)
Eligible if neonate with a CCS eligible condition; neonate 0-28 days if no CCS eligible condition but develops condition that requires specific NICU services and meets acuity care criteria
Accidents, Poisonings, Violence, and Immunization Reactions (ICD-9 800-999)
Eligible if serious, leads to significant disability, and/or requires surgery

Source: Children's Medical Services, Overview of California Children Services (CCS) Medical Eligibility and General Medical Therapy Unit (MTU) Eligibility; California Children Services Manual of Procedures, Chapter 2 Medical Eligibility; International Classification of Diseases, 9th Revision, 1999.

Note: ICD-9 codes in the table refer to coding ranges for disease classification rather than to eligibility for CCS, which is based on clinical guidelines rather than on ICD-9 coding.

Table 3.2 – Most common medically eligible diagnoses among Medi-Cal enrollees receiving CCS services (1995)

Diagnostic Category	ICD-9 Coding	Total Number of Children	
		Number	Frequency Ranking
Congenital anomalies	740-759	13,953	1
Cerebral palsy	333.7, 343, 344.0-.5,767.7	8,075	2
Congenital heart disease	745, 746, 747.1,-.4	3,478	3
Neoplasms/malignancies	140-239	3,327	4
Respiratory distress syndrome	769, 770.8	2,245	5
Prematurity	765.0, 765.1	2,056	6
Seizure disorder	345, 780.8	1,976	7
Strabismus	378.0-.7	1,777	8
Cleft palate/lip	749	1,739	9
Spina bifida	741	1,228	10
Hydrocephalus	741.0, 742.3	1,077	11
Leukemia	204-208	999	12
Asthma	493.0, 493.1, 493.2, 493.9	813	13
Sickle cell disease	282.4, 282.6	779	14
Bronchopulmonary dysplasia	770.7	713	15
Head trauma/brain injury	851-854	708	16
Chronic renal disease	581, 582, 583, 585, 753.1	665	17
Congenital hip dysplasia	754.3, 755.6	657	18
Scoliosis	737.3, 737.4, 737.9	611	19
Arrythmia	427.0-427.9, 997.1	444	20
Muscular dystrophy	359.1, 359.2, 359.8	398	21
Arthritis	711.0, 714, 716.9, 720	392	22
Cystic fibrosis	277.0	388	23
Diabetes	250.1-250.9	365	24
Renal insufficiency	584, 586, 588, 593.9, 997.6	307	25
Hemophilia	286.0-286.2	285	26
HIV disease	042-044	220	27
Pyloric stenosis	750.6	198	28
Burns	940-946 - if .3,.4,.5	191	29
Biliary artresia	751.6	117	30
Growth hormone deficiency	258.8	97	31

Source: California Children's Medical Services (May 1996).

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As a medical program, CCS can authorize services that include diagnosis, treatment, surgery, physical and occupational therapy, equipment and its maintenance, transportation, and other special treatment (such as home health, and speech therapy) (SDHS 1979). In terms of coverage of diagnostic services, the CCS manual indicates that "Diagnostic services shall be provided upon evidence or suspicion that the eligible condition exists" and that "services necessary to establish a working diagnosis may be authorized" (SDHS 1979). Treatment services can extend to a non-CCS eligible medical diagnosis if the non-eligible condition develops during a hospital stay that is related to the CCS diagnosis, or if the non-eligible condition "interferes with, modifies, or complicates the treatment of an eligible condition" (SDHS 1979).

For the medical eligibility determination process, children who are thought to have a CCS eligible condition are referred by their physicians (or other provider or even family members) to CCS. After both financial and medical need screening, a determination of CCS eligibility is made. The screening of medical eligibility may involve diagnostic services that can be authorized by CCS. Financial screening requirements involve a certification of family income and resources. For children who are enrolled in Medi-Cal, CCS is designated as the agency that authorizes Medi-Cal benefits relating to CCS diagnoses. The interagency agreement between Medi-Cal and CCS delegates this authorization role to CCS whether or not the family completes the CCS certification process.

Agency Structure and Organization

Responsibility for the CCS program is divided between state and local offices. CMS in the California State Department of Health Services performs the provider credentialing function and maintains the statewide database of paneled providers. The largest counties in California operate CCS programs that are administered locally but that are bound by program policies and procedures set by State DHS. California's Administrative Code states that either the county health department or health and welfare department in a county with over 200,000 residents must administer an independent program, and that counties with fewer than 200,000 residents may choose to operate an independent program or operate a program jointly with SDHS. There also are three regional CCS offices (in San Francisco, Sacramento, and Southern California) with medical consultative staff who provide a consulting function to local programs with respect to medical eligibility. The regional offices also provide consulting and other expanded support to counties that have dependent CCS programs. The regional offices also have medical consulting staff who review appeals and questions that may arise in the independent counties that are covered by the specific regional office.

Thus while it is a statewide program, some characteristics of the CCS program vary across California's 58 counties. As previously described, one of these characteristics is the administrative status of the county CCS program. Independent counties operate their own case management system. In contrast, the dependent counties administer financial eligibility aspects of the program but rely on the regional office for case management functions. The assigned regional office (San Francisco, Sacramento, or Southern California) varies by county based on the county's geographic location. Finally, some county CCS programs reside in the health department while others are located within the welfare department.

3.2 Payment Mechanisms in Fee-for-Service Medi-Cal

This section describes how services traditionally have been billed for child Medi-Cal beneficiaries who may be eligible for CCS. This includes a description of the providers and agencies involved, as well as a description of the relevant policies and procedures for authorization requests and claims submittal.

Authorization Sources for Child Health Services

As illustrated in **Figure 3.1, Medi-Cal payment and authorization under fee-for-service**, there are a number of mechanisms that have been established in Medi-Cal by which providers can seek payment for child health services. Under fee-for-service, most basic ambulatory services such as well and sick child office visits are billed directly to Medi-Cal with no authorization required. Claims for these services are sent directly to the fiscal intermediary after the service is rendered, for claims processing.

When a request for authorization is received, any of these entities (the local Medi-Cal field office, CCS, or State Medi-Cal) may authorize a Medi-Cal service, decline to authorize the service, or defer the request to another entity for review and consideration. Claims for authorized services are identified in Medi-Cal data by the presence of a Treatment Authorization Request (TAR) indicator with a code that is unique to each authorizing entity.

Medi-Cal Field Office authorization Some Medi-Cal services such as specialty care and certain products or equipment require pre-authorization.[5] For these services, the provider submits a request to the assigned Medi-Cal field office for review prior to providing the service.[6] There are seven regional Medi-Cal field offices that review authorization requests for Medi-Cal benefits. This authorization process exists for all Medi-Cal beneficiaries. The location of these offices and their assigned counties are illustrated in **Figure 3.2, Authorization sources: Assigned Medi-Cal field**

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[5] The categories of services that require TAR approval from a local field office include the following: adult day health care, dental hospitalizations, elective hospital admissions, elective hospital surgeries, extensions of acute hospitalizations, hemodialysis, home health agency services, hospice care, intermediate care facility (ICF-DD, ICF-DD/N, ICF-DD/H), kidney transplants, office visits, outpatient, outpatient "other", outpatient services, surgeries, psychiatry, transitional care, and mental health (for excluded services, which are those not covered under the Medi-Cal mental health carve-out) (Medi-Cal Provider Manual, 2000).

[6] This figure does not illustrate an additional billing mechanism for child health screening services. When provided to child Medi-Cal beneficiaries, these services generally are billed directly to the SDHS through the Child Health and Disability Prevention (CHDP) program. This program operates an administrative and claims system that is separate from Medi-Cal. These CHDP screening services are part of the EPSDT Medicaid benefit for children. In some cases, screening services may be billed to Medi-Cal as ambulatory visits rather than to CHDP.

office by county, and regional CCS office (for "dependent" counties).[7] The administrative agreement between Medi-Cal and CCS specifically states that the need for services for CCS-eligible diagnoses is to be determined by the local CCS program. The Medi-Cal field office can defer a request for authorization to CCS, for a service that is a Medi-Cal benefit but is potentially related to a CCS eligible medical diagnosis. A treatment authorization request (TAR) can be approved, approved as modified, deferred for more information, or denied (Medi-Cal Provider Manual 2000).

Figure 3.1 – Medi-Cal payment and authorization under fee-for-service
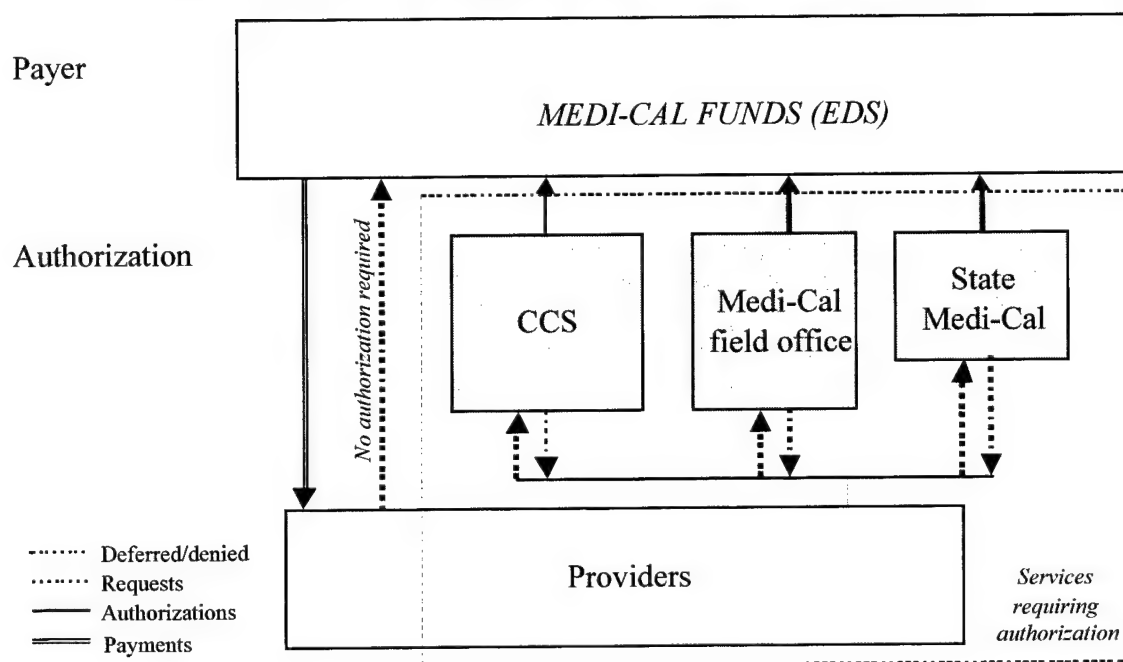
[7] **Figure 3.2** shows the seven regional Medi-Cal field offices and their assigned counties. Another field office was operating during the study period in Alameda County, but that field office was subsequently closed with authorizations now handled by the San Jose field office. As discussed in this section, these field offices evaluate authorization requests for any fee-for-service beneficiary. However, authorization requests for pharmaceuticals are handled by two separate Medi-Cal offices; one office serves the 48 Northern California counties, and another office serves the ten Southern California counties (Medi-Cal Provider Manual 2000). In addition, each of the seven regional Medi-Cal field offices also has special responsibility for a subset of services. For these services, the specific field office is responsible for those services statewide, irrespective of the source county. These field offices (and services) are as follows: Fresno (hearing aids, oxygen and respiratory equipment, orthotics and prosthetics, respiratory care services); Los Angeles (detoxification); Sacramento (non-emergency medical transportation for 48 Northern California counties); San Bernardino (nursing facilities); San Diego (medical transportation for 10 Southern California counties); San Francisco (organ transplants, EPSDT nutritional services, durable medical equipment (DME), occupational therapy, physical therapy, podiatry (including orthotics and prosthetics dispensed by a podiatrist), speech therapy, subacute); and San Jose (incontinence supplies, intravenous equipment, medical supplies, suction pumps). Thus the carve-out effect in each county could conceivably be influenced by behavior/policy and procedure changes in more than one Medi-Cal field office. (CCS program offices handle nearly all authorization requests related to the eligible diagnosis for a CCS participant, irrespective of the type of service.)

CCS authorization The CCS program shares an authorization function with the Medi-Cal field office but has a specific target population and provides additional services. For children enrolled in Medi-Cal who have CCS qualifying medical diagnoses, services provided for the CCS eligible diagnosis are paid on a fee-for-service basis by Medi-Cal (through its fiscal intermediary) once authorized by CCS. This is based on the long-standing interagency agreement between Medi-Cal and Children's Medical Services (Title V) codified in California's Administrative Code. According to the CCS manual, "Any child certified as eligible for Medi-Cal, who has a CCS eligible condition, shall be referred to CCS for authorization and case management services" (SDHS 1979). Counties with independent CCS programs are illustrated along with dependent counties and their assignment to regional offices in **Figure 3.2**.

Figure 3.2 – Authorization sources by county: Assigned CCS regional office and Medi-Cal field office
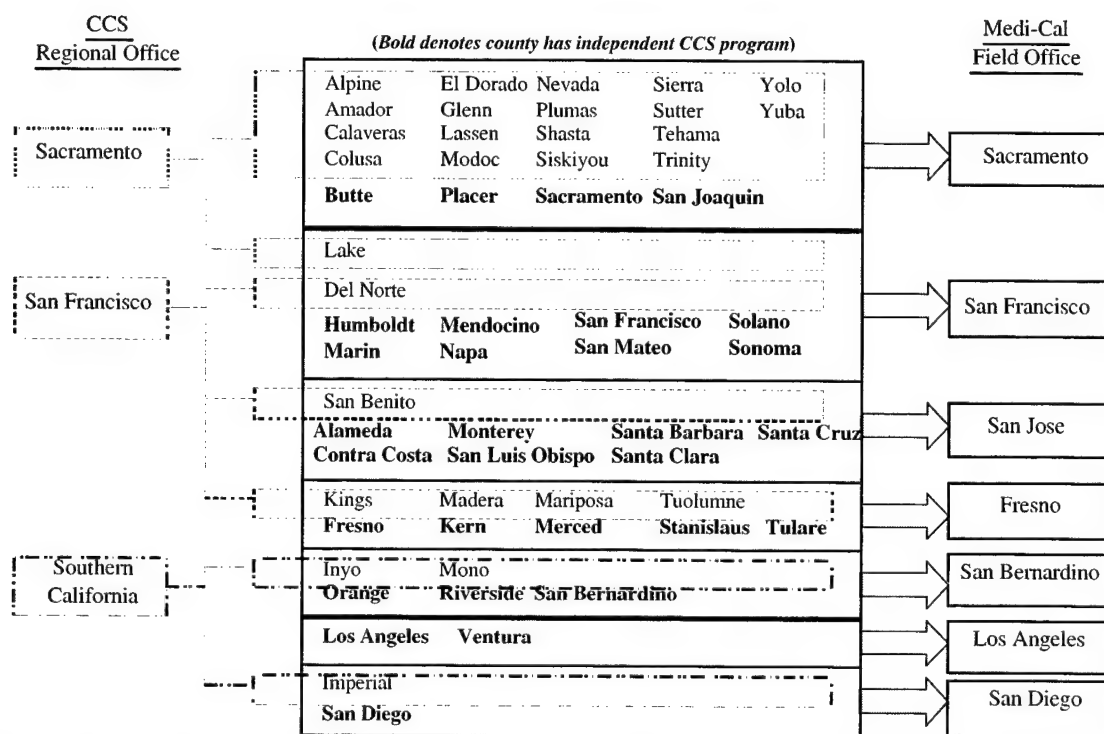
Counties are assigned to a northern or southern office for pharmacy authorization. Each field office handles certain regionalized authorizations.

For child Medi-Cal beneficiaries who are identified as having CCS eligible medical diagnoses, CCS provides an administrative case management role, and authorizes medical services based on the child's treatment plan. CCS uses medical information provided by the child's treating physician(s) to determine the scope of services that can be provided within an authorization, along with the provider(s) that is/are authorized to provide the care, and the time period within which the care will

be provided. Once authorization is made, the CCS agency will approve and submit claims directly to the Medi-Cal fiscal intermediary for payment.[8] Thus for the most part, CCS pre-authorizes services. Services can be reimbursed if not pre-authorized under certain circumstances, such as emergencies and pre-approved standing authorizations, but this is the exception rather than the rule.

Regional Medi-Cal Office authorization Finally, regional Medi-Cal offices also are characterized in **Figure 3.1** as distinct potential payers for children because these offices authorize certain services that the local field offices do not. These services include pharmaceuticals (with a Northern Office in Stockton and a Southern Office in Los Angeles) and In-Home Services through the Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) child health benefit in Medi-Cal (handled by an office in Sacramento or an office in Los Angeles, depending on the county of residence). In-Home services are a specific Medicaid benefit that can be authorized by In Home Operations in the Medi-Cal Operations Division. Once submitted to In Home Operations, the office consults with the local CCS office to determine that the child has a CCS eligible condition and that the service is needed because of the CCS eligible condition. As described in a consumer manual on EPSDT authorizations in Medi-Cal, "In Home Operations, pursuant to an agreement with CCS, will make the TAR determination on nursing; however, the formal authorization will come from CCS" (Protection and Advocacy, Inc. 1996).

3.3   California's Medicaid Managed Care Expansion

This section provides a descriptive analysis of California's managed care expansion with particular focus on how it affects children with CCS eligible medical diagnoses.

History of Medi-Cal prepayment

Prepayment of health services in California's Medicaid program began in the 1970's with prepaid arrangements that placed the contractor at limited financial risk for Medi-Cal services. The contracted organizations generally exclusively served Medi-Cal beneficiaries, providing primary care and management of some specialty services. The primary care case management (PCCM) prepaid arrangements were permitted under a series of waivers of Medicaid provisions that were granted by the Health Care Financing Administration (HCFA) in the early 1980's. In two counties—San Mateo and Santa Barbara—California's Department of Health Services established mandatory managed care systems, based on a waiver (initially a 1115 Research and Demonstration waiver and then as a 1915(b) waiver) that extended to a limited number of counties. In other counties in the late 1980's, Medi-Cal expanded its contracting from the limited risk PCCM organizations that had predominated to federally licensed prepaid health plans (PHPs) that served commercial beneficiaries in the State. The PHP contracts issued by Medi-Cal covered a more comprehensive scope of services. In contrast to the COHS counties, enrollment in the PHPs continued to be voluntary. By

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[8] Specifically, the CCS Manual states "Claims must contain the number '8' in the last space of the TAR Control Number block which gives special numeric identity to CCS-authorized services" and that claims must contain the CCS identification stamp.

the 1990's, California's Medi-Cal Managed Care Division (MMCD) had contracts with multiple federally licensed prepaid health plans, such as Kaiser, Blue Cross, and others.

CCS services within managed care contracts   Many of the Medi-Cal contracts with commercial health plans in the 1990's placed the prepaid health plan at financial risk for medical care that *included* medical services related to CCS diagnoses. Several laws passed in 1992 and 1993 referred to the specific standards of care to which managed care contractors must adhere, concerning children with CCS conditions, and also to the need for actuarially sound rates relating to CCS services. A bill that preceded and that promoted the Medi-Cal managed care expansion outlined in California's *Strategic Plan*—Senate Bill 485 (Chapter 722, Statutes of 1992)—stated that "any managed care contractor serving children with conditions eligible under the CCS program shall report expenditures and savings separately for CCS covered services and CCS eligible children." Assembly Bill 616 (Chapter 938, Statutes of 1993), which was signed into law by the Governor on October 8, 1993, stated that any managed care contractor that served Medi-Cal/CCS children must maintain and follow CCS program standards of care including the use of CCS-paneled providers and CCS-approved special care centers.[9] The bill further stated that "if the managed care contractor is paid according to a capitated or risk-based payment methodology, there shall be separate actuarially sound rates for CCS eligible children."

CCS role for child Medi-Cal beneficiaries enrolled in prepaid health plans While CCS services were included within some PHP contracts, specific roles were identified for the State and county CCS programs. Assembly Bill 616 also stated that "any managed care contract which will affect the delivery of care to CCS eligible children shall be approved by the state CCS program director prior to execution." SDHS issued instructions to managed care contractors in 1996 that also highlighted the role of CCS with respect to children with CCS qualifying conditions who might be enrolled in prepaid health plans. A policy letter issued by the SDHS Medi-Cal Managed Care Division in July 1996 affirmed the specific responsibilities of such PHPs and three operational COHS counties (Santa Barbara, San Mateo, and Solano) with respect to referral of children with possible CCS-eligible conditions to the CCS program (SDHS 1996). For Medi-Cal managed care contracts in which the PHP was at risk for all medical care related to the CCS diagnosis, the policy letter instructed the managed care contractor to identify children with CCS eligible conditions and track services provided to these children. The letter further instructed the plans to "develop and implement procedures to provide timely information on the county CCS program regarding these children." The rationale offered in the policy letter was that even though the PHP was at financial risk for medical services relating to the CCS qualifying medical diagnosis, referral to CCS was needed for purposes of continuity of medical care (should the child later lose Medi-Cal eligibility and thereby disenroll from the PHP, but still potentially meeting non-Medi-Cal CCS resource standards) and for purposes of the child receiving other "wrap-around" services that CCS provides. Examples

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[9] AB 616 reiterates the existing law that managed care contractors "shall maintain and follow standards of care established by the program, including use of paneled providers and CCS-approved special care centers and shall follow treatment plans approved by the program, including specified services and providers of services."

of services that are not covered by Medi-Cal but are covered by the CCS program include care coordination from special care centers, and lodging, food, and transportation to assist the family in accessing authorized medical services.

This policy letter referred to managed care contractors that were enrolling Medi-Cal beneficiaries on a voluntary basis. During the period to which the policy letter applied, enrollment in PHPs and PCCMs was voluntary for Medi-Cal beneficiaries living in the counties where these contracts were in place.[10]

Expansion of Medi-Cal Managed Care

California's 1993 *Strategic Plan for the Expansion of Medicaid Managed Care* outlined the State Department of Health Services (SDHS) intent to implement a managed care expansion that would take place in California's largest counties. This plan was issued after 1992 legislation (Senate Bill 485) that permitted expansion of Medi-Cal managed care including elimination of a cap on Geographic Managed Care enrollment. Under the *Strategic Plan*, the majority of children enrolling in Medi-Cal were to be enrolled in full risk prepaid health plans that would administer and have financial risk for most of enrollees' medical care needs. This plan called for a rapid implementation of mandatory managed care for beneficiaries in most Medicaid eligibility aid categories. **Figure 3.3, Managed care enrollment requirements, by model, for major Medi-Cal aid categories**, illustrates the Medi-Cal eligibility aid groupings that correspond to mandatory, voluntary, or excluded status in the new managed care systems.

In designating counties for the expansion of managed care, SDHS developed specific selection criteria and identified three categories of counties. The first category of counties included those that had the following: (1) significant concentrations of Medi-Cal beneficiaries within the affected aid codes; (2) managed care plan capacity to accommodate 110 percent of the Medi-Cal beneficiaries within the affected aid categories; and (3) most of the elements of a health care delivery system for Medi-Cal beneficiaries (SDHS 1993a). Counties in the first category were those with managed care capacity considered sufficient to cover the targeted Medi-Cal beneficiaries and to permit the fee-for-service system to be "closed" by December 1993. Counties designated in the second category were those with Medi-Cal managed care plan capacity considered adequate to permit a complete transition to managed care by June 1994. All other counties were classified in the third category. The *Strategic Plan* identified 11 counties as priority counties for expansion (i.e., in the first category) based on the size of their Medi-Cal beneficiary populations.

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[10] Of the state and local agencies involved with Medi-Cal/CCS population—including the California Department of Health Services Medicaid Managed Care Division, Children's Medical Services, and county CCS agencies—none has monitored the number of children with CCS conditions who enrolled in PHPs during this period. Original analysis of the prepaid health plan's/managed care contractor's encounter and/or administrative data for this period would be required to generate an estimate of the number of children with CCS qualifying medical diagnoses who were enrolled in such PHPs.

Figure 3.3 – Managed care enrollment requirements, by model, for major Medi-Cal aid categories

Legend:
- Mandatory
- Voluntary
- Excluded

Columns: Two-plan, GMC | COHS

Aid category	Two-plan, GMC	COHS
AFDC/Cash grant	Mandatory	Mandatory
Transitional Medi-Cal	Mandatory	Mandatory
Medically indigent youth <21	Mandatory	Mandatory
Income eligible (no cash grant)	Mandatory	Mandatory
Refugees	Mandatory	Mandatory
Foster care	Voluntary	Mandatory
Supplemental Security Income (SSI)	Voluntary	Mandatory
Blind/disabled (no cash grant)	Voluntary	Mandatory
Share-of-cost (SOC)	Excluded	Mandatory
Long term care (LTC)	Excluded	Mandatory / Voluntary
OBRA alien	Excluded	Excluded

Two plan model counties are Alameda, Kern, Contra Costa, Fresno, LA, Riverside, San Bernardino, SF, San Joaquin, Santa Clara, Stanislaus, Tulare; COHS counties are Orange, Santa Cruz; GMC counties are Sacramento, San Diego

The State of California was limited under its HCFA waiver to a total of five COHS systems. Thus no additional COHS systems were allowed after Orange and Santa Cruz counties (and later Solano with Napa) were added to California's waiver in 1995. Consequently a different type of managed care system was required for further expansion of Medi-Cal managed care. SDHS developed a "Two Plan Model" (described below) for implementation in the new expansion counties. In January 1996, California received formal permission from HCFA under section 1915(b) of the Social Security Act to waive section 1902(a) (which requires program availability throughout a state) to permit implementation in selected counties only; section 1902(a)(10)(B) (which requires comparability of services) to permit additional benefits not available to beneficiaries not enrolled in the Two Plan Model; and section 1902(a)(23) (freedom of choice) to permit the State to require certain beneficiaries to enroll and to restrict beneficiary choice of providers (HCFA 1996; GAO 1997).

HCFA initially approved California's request for waiver authority for January 1996 through 1998. The Balanced Budget Act in August 1997 changed federal regulations for the Medicaid program to eliminate the need for States to obtain waivers of federal law to expand their use of Medicaid managed care. However, these provisions were in place during California's development of its managed care expansion concepts and the implementation. Because these waiver requirements were

effective during California's expansion, significant oversight and approval activities were required by HCFA during the expansion. HCFA granted California's 1996 waivers contingent on several oversight provisions. HCFA's approval emphasized the importance of readiness within each county as well as readiness at the State level in terms of information system capabilities. First, HCFA required that full implementation of the Two Plan Model would not commence in a given county until HCFA had completed an on-site "readiness review" in the county that would focus on beneficiary enrollment, access, quality, and financial solvency issues (HCFA 1996). Another provision of the waiver was that the State had to respond to the needs of individuals with complex medical conditions (HIV/AIDS was offered as the example) by implementing a medical exemption process. This provision addressed concerns about individuals with special health needs being able to access medically necessary services. Specifically, this provision stated that a beneficiary who received Medi-Cal benefits through a mandatory aid category and who was under treatment with a provider who was not participating in the Two Plan Model would be eligible for a medical exemption from enrollment in the Two Plan Model.[11] If the provider was a member of the Two Plan Model network or if the beneficiary was not undergoing treatment, then this provision would not apply.

Medi-Cal Eligibility Groups Affected by the Expansion

Managed care requirements for the different Medi-Cal eligibility aid categories ("aid codes") varied by system design. **Figure 3.3** illustrates the status of some of the largest Medi-Cal eligibility groups with respect to the managed care requirement. The requirements are shown for Two Plan Model and for GMC and COHS models.[12] Most Medi-Cal beneficiaries who are eligible for Medicaid through receipt of public cash assistance are included in the mandatory group. In general, Medi-Cal eligibility aid categories that encompass beneficiaries qualifying due to disability or due to cash assistance related to disability (e.g., Supplemental Security Income, or SSI), children in foster care, and aid categories that see significant month-to-month eligibility changes due to share-of-cost status, are excluded from mandatory participation in Two Plan Model counties but are included in COHS and GMC counties.

The aid categories that comprise the mandatory and non-mandatory groups are further described in **Appendix A.1, Descriptive information for Medi-Cal eligibility aid categories**. This table summarizes managed care participation requirements and several other characteristics of Medi-Cal aid categories. One characteristic that is illustrated in the table is whether at least one beneficiary in the specific Medi-Cal aid category had at least one claim appear in the CCS authorized claims file,

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[11] HCFA's approval of the waiver stated that SDHS must submit reports to HCFA on the first six months of Two Plan Model implementation in a county that included the number of beneficiaries applying for medical exemption during the reporting period; the diagnosis of the beneficiaries' condition (e.g., HIV/AIDS); whether the medical exemption was approved or denied; and any grievances or complaints that had been filed related to the medical exemption process during the reporting period (HCFA 1996).

[12] Small differences are present across the different COHS and GMC models.

for the study period of 1994 through 1997. Tabulations of Medi-Cal claims show that approximately 76 eligibility aid categories contributed at least one CCS claimant between 1994 and 1997. Most aid categories contributed few claimants with about 87.8 percent of the CCS claimants coming from 10 aid categories.[13]

Other characteristics include whether the aid category bestows full scope or restricted[14] Medi-Cal benefits to the beneficiary; whether the aid category requires share-of-cost[15] for any or all beneficiaries; whether the aid category confers a mandatory managed care participation requirement in all versus some of the managed care expansion counties, and whether the aid category indicates that managed care participation is voluntary in some or all of the managed care expansion counties. The aid category are generally grouped in **Table A.1** by the SDHS classification system.

In most counties, the proportion of beneficiaries in mandatory participation aid codes who in fact enrolled in the new managed care system was expected to increase sharply once the COHS plan or the Two Plan Model plans became operational. This was expected because the fee-for-service option was largely eliminated for new Medi-Cal applicants and for current beneficiaries in the mandatory aid categories. This was particularly true in the COHS counties because the aid categories conferring non-mandatory status in the COHS models mostly consisted of those eligible for Medi-Cal due to refugee status and those who became eligible for Medi-Cal retrospectively (e.g., those conferred with one or months of Medi-Cal eligibility based on expenditures incurred and thus

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[13] Total CCS claimants from the aid categories with the largest claimant volume were as follows: 22.8 percent in aid code 30 (cash assistance); 20.4 percent in aid code 60 (Supplemental Security Income, or SSI); 10.6 percent in aid code 34 (low income, non-cash assistance); 9.2 percent in aid code 82 (medically indigent child); 7.7 percent in aid code 35 (cash assistance); 6.1 percent in aid code 58 (OBRA aliens with restricted Medi-Cal benefits); 3.5 percent in aid code 38 (transitional Medi-Cal); 2.6 percent in aid code 72 (133 percent of FPL for children); 2.5 percent in aid code 47 (185 percent FPL for infants); and 2.5 percent in aid code 42 (cash assistance foster care).

[14] Some beneficiaries who qualify for Medi-Cal based on medical need without meeting public assistance income and resource limits receive a "restricted" Medi-Cal benefit rather than the standard, "full scope" benefit package. Restricted Medi-Cal covers emergency services and for pregnant women covers medically necessary pregnancy services including prenatal care and labor and delivery.

[15] Share-of-cost (SOC) applies to some individuals who qualify for Medi-Cal through medically needy (MN) or medically indigent (MI) coverage provisions. Medically needy individuals are those who do not meet income and resource requirements for cash assistance. Medically indigent individuals are those who do not qualify for cash aid or for medically needy eligibility because they do not meet a disability standard or parental work status provision. SOC functions like a monthly deductible. An individual with SOC Medi-Cal becomes eligible for Medi-Cal once a certain amount has been expended on medical care. This "liability" amount will vary by family based on the difference between their income and a federally regulated "maintenance of need" amount. Once the "deductible" is met, Medi-Cal pays all additional costs. If SOC is not met, the individual is not "enrolled" in Medi-Cal for that month. The SOC amount that an individual must meet does not accumulate from one month to another. However, it is possible to carry over a medical bill that exceeds share-of-cost into the next month. Medically necessary services and products that are not part of the Medi-Cal benefit can be applied to share-of-cost (Protection & Advocacy 1994).

could not be assigned "retrospectively" to a health plan). These eligibility groups represent a relatively small proportion of total Medi-Cal beneficiaries.

Managed Care Models

The models of Medi-Cal managed care that were designed for implementation in the expansion counties included the following: County Organized Health Systems (COHS), Two Plan Models, and Geographic Managed Care (GMC).

The 1993 *Strategic Plan* identified the counties slated for COHS systems and also identified the Two Plan Model expansion counties. Counties were selected for participation in implementation of the Two Plan model based on several characteristics. According to a GAO report, two criteria that SDHS used for selection were (1) that the county had a minimum of 45,000 Medicaid beneficiaries who were eligible to participate in managed care (e.g., AFDC and like categories), and (2) that the county had an interest in participating or had a significant managed care presence in the county (GAO 1997).

County Organized Health Systems (COHS) The COHS is a county-administered, managed health care system for Medi-Cal beneficiaries. The COHS contracts with SDHS (under capitation) to provide health care to nearly all Medi-Cal beneficiaries residing in the county. Two counties in California have operated Medi-Cal managed care systems since the early 1980's. For these counties—Santa Barbara and San Mateo—CCS services are provided within a managed care system. This is in contrast to all other counties in which CCS services were paid on a fee-for-service basis by State DHS. The 1993 *Strategic Plan* included plans for additional COHS models in Orange and Santa Cruz counties with Solano and Napa counties added later.

Two Plan Model The 1993 *Strategic Plan* outlined a new type of Medi-Cal managed care system that would establish two competing plans within a county. This model was designed to promote competition by providing beneficiaries with a choice. In the Two Plan Model, a Commercial Plan selected by State DHS as part of a competitive bidding process would compete for beneficiaries along with a Local Initiative Health Plan. The Commercial Plan would be a federally licensed prepaid health plan, similar to the PHPs that contracted with Medi-Cal prior to the expansion. In contrast, the Local Initiative would be a locally designed, quasi-public managed care plan for which statutory governance rules and specific safety-net provider contracting provisions would apply.

The local initiative model was developed by SDHS to accommodate and support the viability of "safety-net" providers to Medi-Cal beneficiaries. Such providers included public county facilities (hospitals and clinics) as well as community clinics and federally qualified health centers (FQHCs) that had served the health care needs of medically indigent persons. The Local Initiative was a unique entity with some flexibility granted by statute for its network design and operations. While all Local Initiatives operate within state regulations, there is some variation in the administration and in the organization of the provider networks across counties. For example, Contra Costa County

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built its Local Initiative around a pre-existing, county-organized health plan (Contra Costa Family Health Plan), while Alameda County created a county-operated plan with independent practice association (IPA) subcontractors. A different organizational strategy was adopted in Los Angeles County, where the Local Initiative operates as a quasi-public entity that is publicly accountable but not county administered, and contracts with seven "plan partners" (commercial prepaid health plans) to provide the medical care.

Counties that were selected for Two Plan Model implementation were Alameda, Contra Costa, Fresno, Kern, Los Angeles, Riverside, San Diego, San Francisco, Santa Clara, Stanislaus, and San Bernardino. Subsequently Tulare became a Two Plan Model County, while San Diego was switched to a Geographic Managed Care county. According to the SDHS *Strategic Plan*, counties in which public and private providers did not express interest in forming a local "consortium" for Medi-Cal managed care would be slated for development of a Geographic Managed Care system (described below).

Geographic Managed Care (GMC) In the Geographic Managed Care (GMC) model, SDHS planned to award a series of contracts to providers (prepaid health plans) at a sufficient number to cover the county's Medi-Cal beneficiary population. The GMC model began as a pilot in Sacramento County and subsequently became an expansion model. In these counties, State DHS contracts directly with multiple commercial plans in the particular county. In contrast to the COHS and Two Plan Model counties, the types of prepaid contracting arrangements that were in place changed relatively little in the GMC counties after the expansion. Counties that were designated as GMC counties included Sacramento and San Diego counties.

Managed Care Network/Fee-for-Service (FFS/MCN) The managed care network (MCN) was designed by SDHS for implementation in some of California's rural counties. In this model, primary care physicians contract with the county and provide case management to Medi-Cal beneficiaries. Reimbursement is on a fee-for-service basis with a case-management rate. Contracts for this system were offered to approximately 27 rural counties (CMA 1995). Several of these counties developed contracts with SDHS, including Sonoma and Placer counties.

3.4   Descriptive Analysis of California's Title V Carve-Out Policy and Implementation

This section describes the design and implementation of California's CCS specialty services carve-out.

Development of the CCS Carve-out Policy

California's Strategic Plan was ambitious in its scope and its timeframe for full implementation. It called for mandatory managed care enrollment of all beneficiaries in certain Medi-Cal eligibility aid categories, regardless of health status. In the 1993 *Strategic Plan*, SDHS stated that its "vision for managed care is an integrated system where the basic Medi-Cal benefit package is coordinated with the array of services that are currently only available through categorical or special waiver programs"

(SDHS 1993a). The plan also indicated that SDHS would solicit Children's Medical Services to "assist in the development of quality assurance criteria and procedures for the review of the care provided to this population by managed care contractors...." On the specific topic of inclusion of CCS services in the prepaid contracts, SDHS stated that "Some models may continue to reimburse CCS level services outside while others may incorporate full risk for all services."

Following the issuance of the *Strategic Plan*, concerns were voiced primarily by providers and by child health advocates that there was not adequate analysis of prepayment to protect Title V-eligible children in a fully capitated, prepaid environment. Advocates voiced concerns that prepaid health plans did not have adequate experience with these children and might subject children with CCS-eligible diagnoses to utilization review and other procedures that could be inconsistent with CCS standards.[16] Legislation passed in 1993 specifically addressed the handling of CCS services within capitated managed care contracts. Assembly Bill 616 noted that the Medi-Cal program had the authority to "amend existing Medi-Cal managed care contracts to include the provision of medical benefits to persons who are eligible to receive medical benefits under publicly supported programs" and that as such, any managed care contractor serving children with CCS conditions must maintain and follow standards of care established by the CCS program. Continuing concerns by advocates culminated in legislation that was passed in 1994 and signed into law on September 28, 1994. The bill was sponsored by an advocacy organization (The Children's Lobby) and by a trade organization (the California Children's Hospital Association). The legislative bill originally proposed to exclude CHDP services (including prevention and treatment services) as well as CCS services from prepaid health plan contracts. However, the legislation that was passed had been modified to address only CCS services.

The Bergeson bill (SB 1371)[17] authorized a "carve-out" of services provided for CCS eligible diagnoses from future Medi-Cal managed care contracts entered into by State DHS. It also included a provision for existing managed care contracts that placed the plan at financial risk for CCS services. The law prohibited renewal of the "CCS-include" contract provision when the contract

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[16] A 1993 review of Medi-Cal managed care by HCFA's Regional Office noted the lack of financial incentives for EPSDT screening services in Medi-Cal managed care contracts. This review stated that "HMOs must absorb all EPSDT costs within capitation rates which are palpably low, and which have not been increased for the past two years (even though additional EPSDT service requirements have been added). Borrowing from the example of its PCCMs, the State should consider paying HMOs under FFS for CHDP/EPSDT health assessment services" (HCFA Region IX 1993).

[17] Specifically, the bill language stated that "CCS covered services shall not be incorporated into any Medi-Cal managed care contract entered into after August 1, 1994...until three years after the effective date of the contract" and further that "providers serving children under the CCS program who are enrolled with a Medi-Cal managed care contractor but who are not enrolled in a pilot project pursuant to subdivision (c) shall continue to submit billing for CCS covered services on a fee-for-service basis until CCS covered services are incorporated into the Medi-Cal managed care contracts" (Senate Bill No. 1371). The bill also provided that "during the three-year time period described in subdivision (a), the department may approve, implement, and evaluate limited pilot projects under the CCS program to test alternative managed care models tailored to the special health care needs of children under the CCS program."

expired.[18] A final provision enacted by the Bergeson bill was to instruct SDHS to develop and implement a set of pilot projects to test various elements of managed care for the CCS population. Initially the bill enacted a three-year ban on managed care contracting for CCS services. However, the carve-out provision did not sunset in August 1997 due to legislation in August 1997 (SB 391) that extended the period of the carve-out to the year 2000, and to legislation in July 1999 (AB 1107) that extended the carve-out to 2005.

An important feature of the 1994 carve-out law is that it excludes from prepayment only those services specifically related to a child's CCS-eligible diagnosis. All other medical services, which include preventive, primary care, specialty care, and Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) supplemental services unrelated to the CCS-eligible diagnosis, are to be provided through the managed care plan as outlined in the *Strategic Plan*.[19] The managed care participation requirement for a child does not change based on identification of a CCS eligible medical diagnosis. Like the managed care expansion provisions, upon start-up of the new managed care systems in the expansion counties, the CCS carve-out policy would immediately apply to all child Medi-Cal beneficiaries who participated in managed care.[20] Because the policy defines the benefits and circumstances for which the plans are responsible, the policy applies to all child beneficiaries enrolled in a post-expansion managed care plan, whether the child enrolls voluntarily in a managed care plan (as a member of a voluntary participation group, such as SSI in a Two Plan Model County) or whether the child enrolls in a managed care plan due to membership in a mandated participation group.

How the CCS Carve-Out Operates

Coupled with the managed care expansion, the carve-out divides financial responsibility for health care between managed care organizations and the CCS program. **Figure 3.4, Medi-Cal payer and authorization sources for services to potentially CCS-eligible children—With operating carve-out,** illustrates the mechanisms by which medical services are paid once the carve-out is operational. This figure includes the possible payment arrangements within most counties, although as described below, not all of these payment arrangements can be exercised for all Medi-Cal child beneficiaries in the counties. As discussed below, some of the sources are unique to children enrolled in managed care, and others apply only to children in fee-for-service (i.e., non-mandatory

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[18] COHS counties that were operational by 1994 (San Mateo and Santa Barbara) were unaffected by the carve-out legislation provisions, and the legislation exempted the Solano County COHS that was under development from its provisions. Napa County subsequently joined the Solano County COHS and thus was added to this group of counties exempt from the Bergeson carve-out.

[19] As provided by the *Strategic Plan* and by subsequent policy decisions, other Medi-Cal services are excluded from the managed care contracts, including mental health, pharmaceuticals for HIV/AIDS, and certain medical services for beneficiaries with HIV/AIDS.

[20] Children with SSI-related or foster care-related Medicaid eligibility and those children with share-of-cost Medicaid eligibility are not mandated to enroll in prepaid health plans, and unless they voluntarily enroll would continue to receive all Medi-Cal services on a fee-for-service basis.

eligibles). Like **Figure 3.1**, this figure shows that some Medi-Cal services can be submitted directly to Medi-Cal, while other services require authorization from CCS or from a local Medi-Cal field office. This figure shows the multiple potential authorization and payment sources with the CCS carve-out and managed care system in place.

Figure 3.4 – Medi-Cal payer and authorization sources for services to potentially CCS-eligible children—With operating carve-out
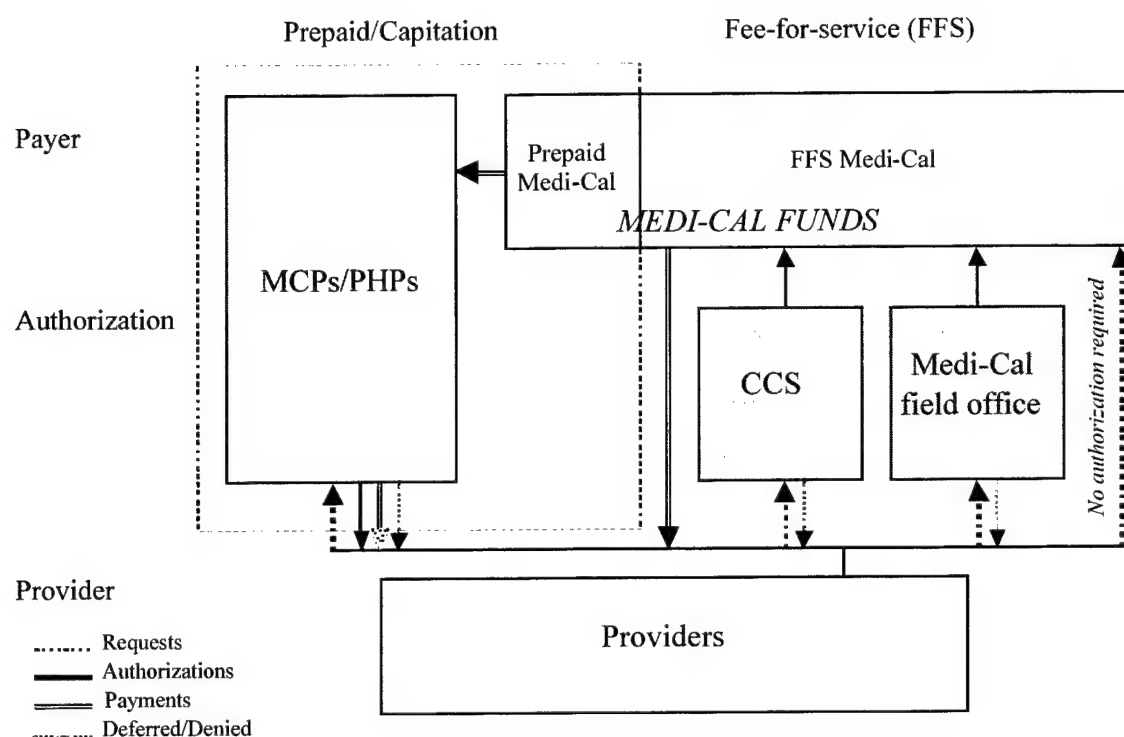
An important point illustrated in **Figure 3.4** is that there are not only multiple authorization sources but also new organizations involved in the authorization and payment processes. The figure also illustrates the prepaid health plan mechanisms for payment, which can include per member per month payments to providers, and potentially fee-for-service (FFS) payments for some services under pre-authorization. It is important to note that those services for which a sub-contracting hospital or IPA/provider is at risk may vary by prepaid health plan. Some services may be paid FFS by a health plan and others covered within the capitation rate, depending on the county and the specific contract within the county. (A discussion earlier in this section addressed the presence of managed care contractors and their relationship to CCS prior to the expansion).

Implementation of the CCS Carve-out

The payment arrangements that operated prior to and following the managed care expansion are illustrated in **Figure 3.5, Pre and post carve-out Medi-Cal payment arrangements—Managed care expansion counties, Figure 3.6,** and **Figure 3.7.** To distinguish pre carve-out managed care plans ("PHPs") from post carve-out managed care plans—some of which are commercial prepaid health plans and some of which are Local Initiatives or County Organized Health System plans—all managed care plans operating under the carve-out provision are referred to as "MCPs" in the text and figures that follow.

For the managed care expansion counties, the implementation of the CCS carve-out occurs simultaneously with the mandate of participation in prepaid health plans. The exact start-up dates for the expansion and carve-out varied on a county-by-county basis. In the managed care expansion counties, the carve-out policy applies to any child Medi-Cal beneficiary who enrolls in a managed care plan operating under the Two Plan Model, GMC, or COHS system (with the exception of several counties)[21]. For children in voluntary or excluded aid categories who remain in the fee-for-service system in these counties, the carve-out policy does not apply unless they voluntarily enroll in managed care. The Two Plan counties continue to operate a fee-for-service Medi-Cal system for these children (as well as for the adult beneficiaries in these aid categories).

The implementation process for counties that implemented the CCS carve-out and mandatory managed care is illustrated in **Figure 3.5.** The figure shows how the possible payment arrangements in a county are telescoped into two possible arrangements in the post carve-out period: (1) fee-for-service Medi-Cal with fee-for-service CCS services, and (2) managed care Medi-Cal with fee-for-service CCS services. All PHP "CCS-include" contracts were phased out as the managed care expansion plans that would operate under the carve-out policy were phased in. Some Medi-Cal contracts with such PHPs expired prior to or at the expansion implementation date. Other such contracts were rolled over into the new "carve-out" contract arrangement if the PHP was part of the expansion system. In three (3) expansion counties, at least one PHP had a roll-over contract into a Commercial Plan or GMC contract. The expansion counties that had participation in "CCS include" prepaid health plans shortly before the expansion dates are identified in **Table A.2, Commercial health plans operating in managed care expansion counties, pre and post carve-out.** As indicated in the table, approximately eight (8) of the expansion counties had such plans in operation. This table also identifies the Commercial Plans that are participating in the Two Plan or GMC models.

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[21] San Mateo and Santa Barbara counties have different arrangements that are not illustrated in this figure (these counties were fully implemented prior to the 1993 Strategic Plan and are not technically expansion counties). Also, Sacramento County continued to have one PHP (Kaiser) operate with a "CCS include" Medi-Cal contract following the expansion, and Solano and Napa counties were specifically identified in legislation as exceptions to the carve-out policy.

Figure 3.5 – Pre and post carve-out Medi-Cal payment arrangements—Non-managed care expansion counties that have _no_ managed care
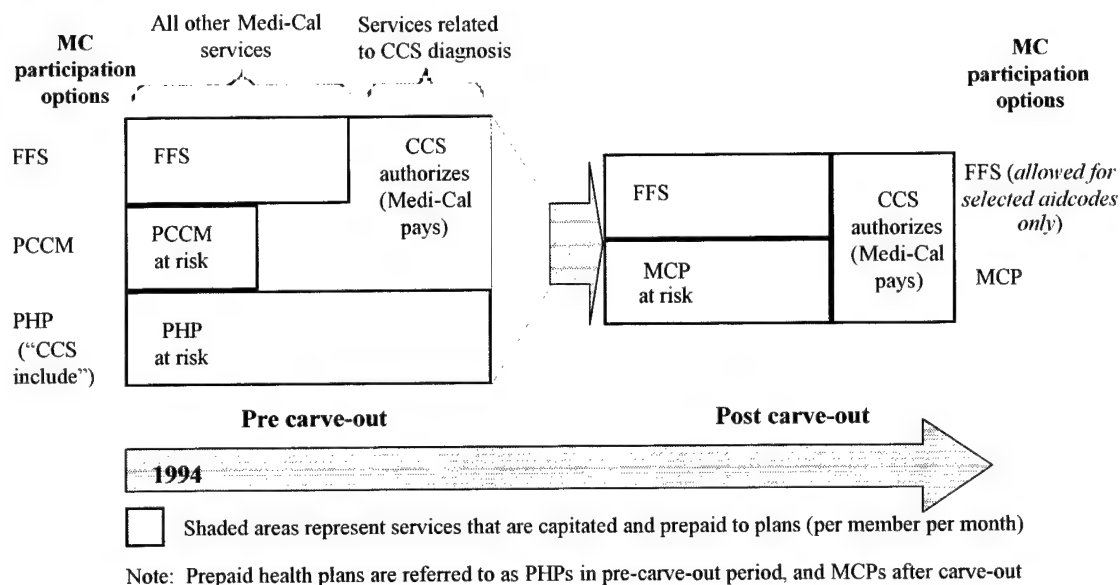
Figure 3.6 – Pre and post carve-out Medi-Cal payment arrangements—Non-managed care expansion counties that have _voluntary_ managed care

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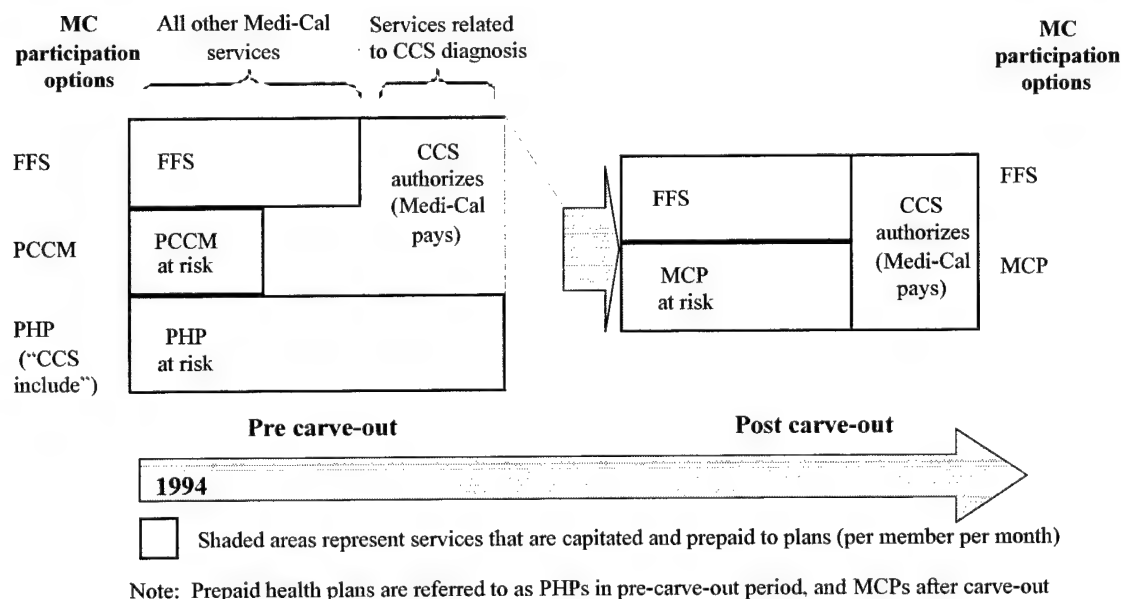
Figure 3.7 – Pre and post carve-out Medi-Cal payment arrangements—Non-managed care expansion counties that have _no_ managed care
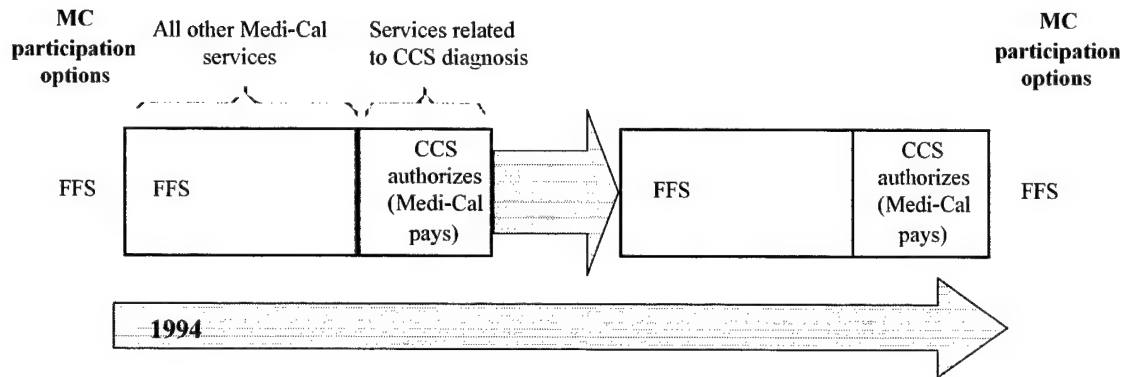
Managed care participation for individuals in the mandated eligibility aid categories operated in the following way. Once a child enrolled in the managed care plan under the new system, the carve-out arrangement was in effect for that child. However, the expansions did not occur within the timeframe described in the Strategic Plan (1993 and 1994), nor did the Local Initiative and Commercial Plan in each county necessarily begin enrollment at the same time. For most of the Two Plan model counties, the Commercial Plan and the Local Initiative did not begin operations simultaneously, due to start-up delays for one plan or the other usually imposed by HCFA based on HCFA's readiness review. During this phase-in period, all Medi-Cal beneficiaries were given the opportunity to remain in fee-for-service, or to voluntarily enroll in the new (carve-out) managed care plan that was operational.

In the Two Plan Model Counties, when both the Local Initiative and the Commercial Plans became operational (or when both Commercial Plans were operational in a county that did not form a Local Initiative, such as Fresno County), those beneficiaries who were enrolled in health plans that had expiring Medi-Cal managed care contracts were either "rolled over" to one of the new contracting health plans or selected one of the operating health plans. A "default assignment" was applied to all beneficiaries in mandatory managed care groups who did not return managed care enrollment materials to SDHS or who did not specify a choice of managed care plans in the materials. The default assignment process generally followed a formula created by SDHS that was designed to achieve a certain flow of beneficiaries to the participating health plans within the county and to achieve a certain, pre-specified enrollment balance across the plans. (For example, the Local Initiative plan in each county was to maintain at least 60 percent of mandatory managed care eligibles, according to state law).

Experiences with "Roll-Out" in the Expansion Counties   While managed care participation continued on a voluntary basis until all plans in the Two Plan Model counties were fully operational, in practice this voluntary basis was not identical to the voluntary participation

provision that existed in the pre-expansion period with the commercial prepaid health plans. Specifically, as of July 1996 the SDHS policies and procedures in the Two Plan model counties were modified such that new Medi-Cal beneficiaries and also those undergoing their periodic eligibility redetermination were assigned to the sole operational plan by "default", unless the beneficiary stated a preference in the application materials for remaining in fee-for-service. This default assignment policy thus placed a greater responsibility on the beneficiary to exercise the fee-for-service choice than had existed prior to the policy.

The initial implementation schedule called for simultaneous operation start-up in March 1995 for all expansion counties (GAO 1997). However, the expansion counties not only implemented their managed care systems at different times but also experienced transition periods (e.g., the period of time between initial implementation of one plan through full implementation of both plans with default assignment) of different lengths due to factors that are inexorably linked to county characteristics. In some counties, default assignment was not implemented until several months after both plans were operational. These delays not only delayed the initial implementation date but also caused a staggered implementation by county.

Table 3.3, Implementation characteristics of counties with Medi-Cal managed care, presents Medi-Cal policy characteristics related to the managed care expansion and CCS carve-out by county. Specific characteristics include the total number of Medi-Cal aid categories affected by the expansion (and carve-out) in the Medi-Cal managed care expansion counties, the managed care model type and implementation date(s), the presence of PHPs and/or PCCMs in the pre-expansion period, the presence of PHP contracting with a CCS "carve-in" in the pre-expansion period, the presence of a CCS carve-out, and start dates by quarter and month of the study period (1994-1997). The start date refers to the first month in which any expansion managed care plan was operating under the carve-out policy. As this table illustrates, the date that both health plans were operational in Two Plan counties ranged from July 1996 to January 2000. These dates correspond to the date at which assignment to a health plan is required for all mandatory managed care beneficiaries. This is the "default assignment" start-up date described earlier. The dates that the two COHS expansion counties were fully operational came somewhat earlier, in January 1996 (Santa Cruz) and April 1996 (Orange).

The initial delays in system development and start-up occurred due to the lengthy planning and strategic development processes that had to take place at the county level, while delays imposed closer to the implementation dates most frequently were imposed by HCFA. Several delays unique to the Two Plan model counties included delay in developing a Request for Applications for the commercial plan selection, and in developing a Detailed Design Application for the local initiative applicant. Local initiatives also required statutory authority for operation, and thus legislation had to be written and adopted. Local initiatives had to develop an operational health plan from the ground up (and had to involve local stakeholders in their planning process) while commercial plans had to develop new provider networks to serve Medi-Cal beneficiaries in counties where they had not previously operated.

Table 3.3 – Implementation characteristics of counties with Medi-Cal managed care

Managed care model	County (#)	Total mandated aidcodes	Pre-MC expansion		Post-MC expansion				
			Any PHP/ PCCMs	Any PHP "carve-in"	CCS carve-out	Plan type(s)[e]	Start date	Study qtr (1-16)	Study mo. (1-48)
MC expansion counties—Early implementing counties (4)									
2-plan	Alameda (01)	26	Yes	No	Yes	LI	1/1/96	9	25
						CP	7/1/96	11	31
2-plan	Kern (15)	26	No	No	Yes	LI	7/1/96	11	31
						CP	9/1/96	11	33
COHS	Orange (30)	60	Yes	No	Yes	—	10/1/95 [f]	5	22
						—	2/1/96 [g]	9	26
						—	4/1/96 [h]	10	28
COHS	Santa Cruz (44)	61	No	No	Yes	—	1/1/96	9	25
Other MC expansion counties (10)									
2-plan	Contra Costa (07)	26	Yes	Yes (2)	Yes	LI	2/1/97	13	38
						CP	3/1/97	13	39
2-plan	Fresno (10)	26	Yes[d]	No	Yes	CP-1	1/1/97	13	37
						CP-2	11/1/96	12	35
2-plan	Los Angeles (19)	26	Yes	Yes (10)	Yes	LI	4/1/97	14	40
						CP	7/1/97	15	43
2-plan	Riverside (33)	26	Yes	Yes (2)	Yes	LI	9/1/96	11	33
						CP	3/1/98	—	—
2-plan	San Bernardino (36)	26	Yes	Yes (3)	Yes	LI	9/1/96	11	33
						CP	3/1/98	—	—
2-plan	San Francisco (38)	26	Yes	Yes (3)	Yes	LI	1/1/97	13	37
						CP	7/1/96	11	31
2-plan	San Joaquin (39)	26	Yes	Yes (1)	Yes	LI	2/1/96	9	26
						CP	2/1/97	13	38
2-plan	Santa Clara (43)	26	Yes	Yes (1)	Yes	LI	2/1/97	13	38
						CP	10/1/96	12	34
2-plan	Stanislaus (50)	26	No	No	Yes	LI	10/1/97	16	46
						CP	2/1/97	13	38
2-plan	Tulare (54)	26	No	No	Yes	CP-1	2/1/99	—	—
						CP-2	1/1/00	—	—
Other MC expansion counties—Unique MC models (3)									
FFS/MCN	Placer (31)	21	No	No	Yes	—	10/1/97	16	46
GMC	San Diego (37)	22	Yes	Yes (3)	Yes	—	4/1/97	14	40
FFS/MCN	Sonoma (49)	21	Yes	Yes (1)	Yes	—	3/1/97	13	39
Other MC expansion counties—Not implementing CCS carve-out (5)									
COHS	Napa[h] (28)	65	No	No	No	—	—	—	—
GMC	Sacramento (34)	22	Yes	Yes (1)	No[c]	—	4/1/94	2	4
COHS	San Mateo (41)	66	—	—	No	—	1987	—	—
COHS	Santa Barbara (42)	61	—	—	No	—	1983	—	—
COHS	Solano (48)	66	—	—	No	—	5/1/94	2	5
Non-MC expansion counties—With voluntary MC (3)[a]									
—	Madera (20)	—	Yes	—	No	—	—	—	—
—	Marin (21)	—	Yes	Yes (1)	No	—	—	—	—
—	Yolo (57)	—	Yes	Yes (1)	No	—	—	—	—

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The delays that occurred later largely resulted from the "readiness reviews" that HCFA conducted
prior to full implementation (mandatory participation) in each county. Most of the difficulties
occurring in the counties that were identified by HCFA as necessitating a postponement had to do
with the enrollment contractor or with deficiencies identified in the materials that beneficiaries were
receiving about their managed care options. For example, the need to test enrollment broker
capacity and functions delayed implementation in Fresno, Contra Costa, San Joaquin, and Santa
Clara counties. HCFA postponed automatic assignment of beneficiaries in Santa Clara, San Joaquin,
and Los Angeles who did not choose a plan, permitting only voluntary participation and thus
slowing the implementation process (GAO 1997). The size of the affected population (over one
million expected mandatory enrollees) in Los Angeles County caused a 1997 delay of several
months due to HCFA concerns that enrollment problems would have an impact of substantial
magnitude in such a large county. **Figure 3.8, Carve-out timing and duration of
implementation transition**, illustrates the roll-out of the managed care expansion.

Figure 3.8 – Carve-out timing and duration of implementation transition

□ Denotes pre-expansion period   □ Denotes all plans fully operational _and_ default assignment in place
□ Denotes transition period   □ Denotes phase-in by aidcode

Counties (top to bottom): Orange, Santa Cruz, Alameda, Kern, San Joaquin, San Francisco, Santa Clara, Fresno, Contra Costa, Stanislaus, Los Angeles, Riverside, San Bernardino, Tulare

Timeline: 1994   1995   1996   1997
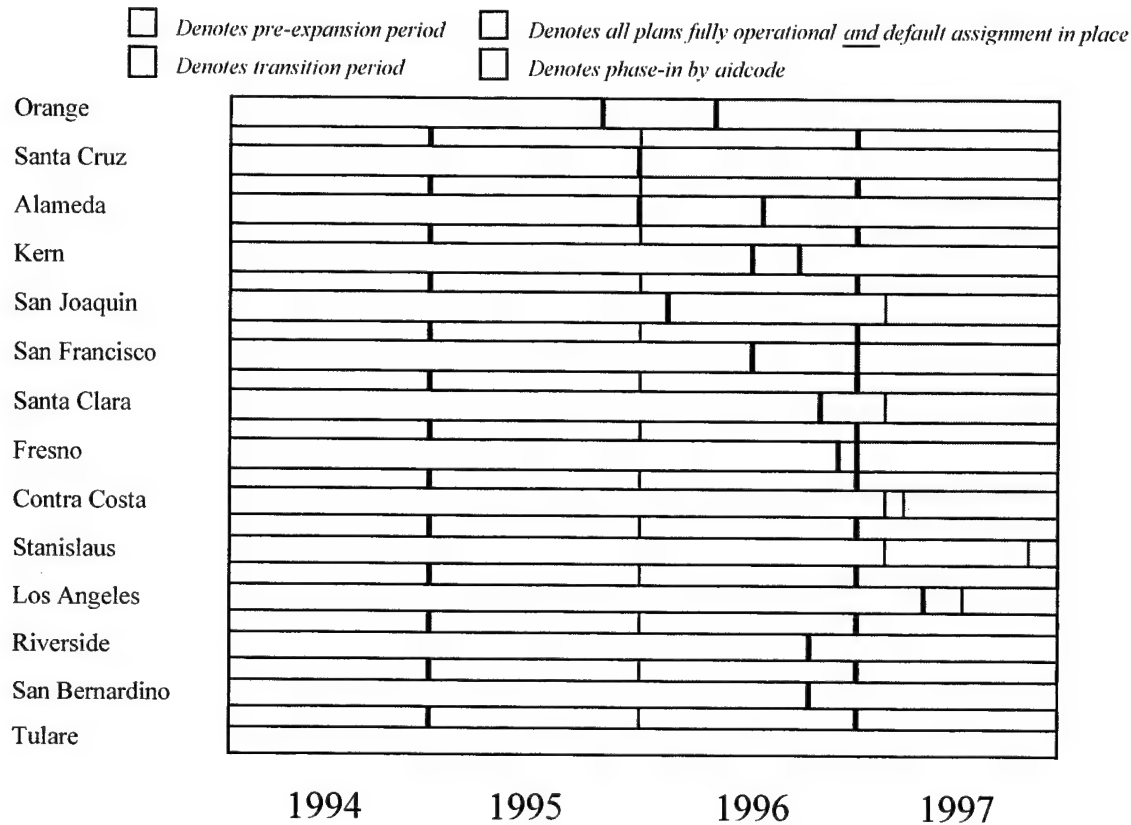
Other delays that were unique to the Commercial Plans or to other unique features of the Two Plan Model County continued to occur for the small number of the Two Plan Model counties that did not implement the managed care expansion by the end of the study period (December 1997). Implementation was postponed in Tulare County due to difficulties in organizing provider networks, while the commercial plan operating in San Bernardino and Riverside counties did not meet the federal Medicaid "25/75" requirement (GAO 1997). The Local Initiative in these counties began operations and continued to operate under voluntary participation.

Additional legislation pertaining to the relationship between CCS services and the scope of Medi-Cal managed care contractor's responsibilities for medical care was passed in 1996. Assembly Bill 3199 permitted SDHS to "approve, implement, and evaluate a pilot project in Tulare County" that would incorporate CCS services into the Local Initiative in that county. The bill stated that SDHS would be required to approve and develop such a pilot project "if requested by Tulare County." The bill provisions stated that children eligible for Medi-Cal and for CCS would be required to enroll as members of the Local Initiative and that the County of Tulare was authorized to negotiate with SDHS in developing this pilot project. Section (c) (1) provided that SDHS and a special advisory commission would need to agree on an appropriate capitation rate for services covered under CCS that would be "in compliance with federal and state laws and regulations" and "cost neutral to the

General Fund." Section (c) (2) (h) stated that such permission would be granted to SDHS until July 1, 1999 and that the bill would remain in effect until January 1, 2000 at which point the provision would be repealed unless additional legislation was passed before January 1, 2000 to extend the dates.[22]

Impact of the Carve-out on Non-Expansion Counties

While the carve-out provisions that related to CCS services under mandatory managed care did not apply to those counties that were not managed care expansion counties, the carve-out law did have some impact on non-expansion counties that had some Medi-Cal managed care contracting. For a small number of California counties that were not designated as Medi-Cal managed care expansion counties—including Marin and Yolo counties—State DHS had ongoing managed care contracts with prepaid health plans when the Bergeson legislation was passed. The pre and post-carve-out payment arrangements in these counties that had voluntary Medi-Cal managed care but were not expansion counties (and thus had no mandatory enrollment) are illustrated in **Figure 3.7**. As the figure shows, these counties had two options for Medi-Cal services at the time that the carve-out law was passed. These options were (1) participation in fee-for-service Medi-Cal, and (2) participation in a commercial prepaid health plan with a "CCS include" contract.

Initially the State DHS interpreted the Bergeson carve-out as applying only to (1) future managed care contracts in expansion counties; and to (2) existing managed care contracts in the expansion counties that might come up for renewal prior to the start up dates for the Two Plan Model plans or the COHS system. SDHS did not interpret the carve-out as applying to the managed care contracts that were operating in several *non*-managed care expansion counties. At the time, these counties included Madera, Marin, and Yolo counties. Following efforts by a state advocacy group for children, the State DHS reviewed its existing managed care contracts for compliance with the provisions of the Bergeson bill. In effect, SDHS thereby broadened the scope of its interpretation of the law so that the Bergeson provision on new contracts and contract renewals would apply to counties outside of the expansion counties (personal communication with CMS, July 1999). In late 1996 and early 1997, SDHS set a process in motion to exclude CCS services from the managed care contracts in the non-expansion counties that had operating Medi-Cal managed care contracts (personal communication with CMS, July 1999). Thus while SDHS eventually applied the carve-out provision to all PHP contracts, the date of the CCS services carve-out was the same date as the start-up date for mandatory PHP enrollment only in the expansion counties. More specifically, the dates were the same only in the expansion counties that implemented mandatory managed care prior to the end of 1997.

Finally, a large number (33) of California counties have not had any Medi-Cal managed care contracting. **Figure 3.6** shows the payment arrangements in counties with no managed care over the course of the managed care expansion and CCS carve-out taking place in other counties. All of the

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[22] Tulare had not developed a pilot that incorporated CCS services by the end of the study period (December 1997).

counties are rural and/or have small populations of Medi-Cal beneficiaries. Another two (2) counties—Sonoma and Placer counties—have FFS/MCN systems under development that provide physicians with a case management fee for providing case management in referral to and use of services outside of primary care. As indicated in **Figure 3.6**, all of these counties are basically maintaining fully fee-for-service Medi-Cal with CCS services continuing to be authorized on a fee-for-service basis by the CCS program. Most of these counties are listed in **Table 3.3** as non-managed care counties and are referred to as "non-expansion" counties. Although they are essentially operating in a fee-for-service Medi-Cal system, Sonoma and Placer counties are identified in **Table 3.3** as managed care expansion counties with unique systems because technically they are implementing a small feature of managed care.

Rate-Setting Methodologies and Impact of Carve-out on Capitation Rates

Because CCS services were excluded from prepaid contracts under the carve-out, SDHS developed capitation rates based on historical claims data that excluded those claims authorized by CCS. The approaches taken by SDHS for developing capitation rates prior to and following the carve-out are briefly described below.

In the pre-expansion managed care contracts, SDHS negotiated directly with prepaid health plans to establish per member per month (PMPM) capitated rates. A different rate setting methodology that was experienced-based was adopted for the expansion. The State of California used a complex methodology to develop payment rates for the new managed care systems.[23] This methodology was based on the following: (1) historical claims (initially for FFS claims with dates of service of January 1993 through December 1993 and paid through July 1994, excluding COHS counties of San Mateo, Santa Barbara, and Solano); (2) experience with Medi-Cal managed care utilization in a COHS county (Santa Barbara); (3) projections for new benefits and utilization expectations; and (4) a lag factor for incurred but unpaid claims. The rate methodology included specific county adjustment factors and stratification by several eligibility group factors. Data from the Santa Barbara Health Authority were used to identify the expected units of service per vendor group and per eligibles for capitation rates for the base years of the Two Plan Model counties. The rationale for using utilization data from this COHS county was that Santa Barbara "is a well-managed managed care plan, and provides the best data available at this time" (SDHS 1995).

Because the Bergeson legislation excluded services for CCS eligible conditions from future (and any renewed) managed care contracts, State DHS produced capitation rates for managed care plans that excluded expected CCS service costs. These capitation rates were based on historical Medi-Cal claims and excluded all Medi-Cal claims that were known to be services provided for a CCS-eligible

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[23] The per member per month capitation rates for Local Initiative and Commercial Plan contractors are issued annually by SDHS and published publicly. The capitation rates announced by SDHS have been contested in some instances by one or more Local Initiatives or Commercial Plans. In some instances these contested rates were subsequently augmented by SDHS. Rates for the COHS counties are negotiated and are not made publicly available.

diagnosis. More specifically, all claims that could be identified as having been _authorized_ by CCS (i.e., those claims with a code indicating that the Treatment Authorization Request (TAR) was approved by CCS) were excluded from the rate-setting database (SDHS 1995).[24] Consequently any paid Medi-Cal claims for services that were related to CCS diagnoses, but not authorized by CCS, would be included in the claims base used to create capitation rates. If CCS referral rates and service authorization requests increase as hypothesized, then total fee-for-service CCS authorized Medi-Cal payments could increase as such claims are increasingly picked up by CCS.

3.5   Summary

California developed a set of new delivery systems for Medicaid beneficiaries in the 1990's. The carve-out policy that was adopted in 1994 preserved the traditional Title V role of the CCS program. This chapter's review of Medi-Cal and Title V policy in California shows that the financial implications of referral changed with the carve-out, but that the requirement to refer potentially eligible children to CCS was _not_ new. The policy created new financial incentives by preserving the fee-for-service reimbursement option only for those services that CCS programs would authorize. The difficulty in determining whether specific services are required exclusively for a particular diagnosis suggests that this mixed reimbursement policy could motivate cost-shifting from capitated care to the carved-out services. One result of such cost-shifting practices may be an increased rate of referral to CCS. A possible secondary effect may be compositional change within the CCS caseload in terms of medical diagnosis and expected expenditures per child.

Total services that children receive may not be affected by the carve-out policy, at least relative to what services would have been under a traditional, fully fee-for-service system. However, it is possible that their newly incentivized referral to the CCS program may (1) increase adherence to statutory CCS standards regarding provider paneling, and (2) increase children's access to the administrative case management functions of the CCS program. To the extent that these potential outcomes represent aspects of quality, any carve-out impact could be interpreted as indirectly promoting quality. While study limitations do not permit direct evaluation of this question, the imposed CCS carve-out may increase the proportion of child Medi-Cal beneficiaries with CCS eligible medical diagnoses who receive early and continuing care from CCS-approved physicians and ancillary providers.

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[24] Claims with procedure codes for organ transplant also were excluded. The Rate Development Branch in the Medi-Cal Policy Division used adjustments rather than claim exclusions to adjust for other services eliminated from managed care contracts. Those services included mental health services, long-term care facility charges (other than the month of admission and subsequent month), and ophthalmic lenses. A number of legislative adjustments also are made to the capitation rates as they become effective. Examples of the numerous legislative adjustments made in the base year capitation rates included an adjustment for a drug prescription limit (effective November 1994, prescriptions were limited to six per month resulting in a 6.8 percent reduction in the Pharmacy component), and an adjustment in the Pharmacy component (a reduction of 3 percent to Pharmacy because of a reduction in all pharmacy claims by 50 cents pursuant to Assembly Bill 2377 effective January 1995).

CHAPTER 4—RESEARCH DESIGN AND METHODS

This chapter describes the design and methods employed for the quantitative and qualitative components of the study.

4.1   General Study Approach

The quantitative component of this research is a panel study that compares CCS program outcomes (claimant volume and expenditures) across counties and managed care eligibility groups for a four year period, using California Medicaid (Medi-Cal) claims data for service dates from January 1994 through December 1997. The study examines the relationship between managed care participation under a carve-out program and the volume of CCS claimants and total expenditures for CCS services.

Because the study investigates provider and agency responses to incentives based on county-level policy variables, the unit of analysis is the program outcome (e.g., claimant volume, total expenditures) at the county level or eligibility group level, by month. The population in the study is all Medi-Cal beneficiaries between the ages of 0 to 21 years who have one or more CCS authorized claims during the study period, from a base population of children with one or more months of Medi-Cal eligibility between January 1994 and December 1997.

The qualitative component of this research uses interviews with state and county CCS program administrators to clarify and interpret the carve-out policy's impact. Interviews were conducted with administrators from counties that were selected to provide the following: diversity of county size and geography (which was expected to also provide variation in relevant health system characteristics); a mix of COHS and Two Plan model counties; and differences in Local Initiative models and organization within the subset of Two Plan counties.

4.2   Design and Methods for Analysis of Caseload and Expenditures

This section describes the data sources used for the analyses of caseloads and expenditures, and the construction of the analytic file. This is followed by an outline of the analytic strategy.

4.2.1   Data Sources

To investigate the hypotheses of caseload and expenditure changes over time, individual level claims data for the study period of 1994 through 1997 were required. Additional data elements on Medi-Cal enrollment and managed care participation also were obtained along with information on county characteristics ranging from policy characteristics to socioeconomic indicators. Data sources for most data elements relating to the Medi-Cal program were drawn from the SDHS Medical Care Statistics Section. Specific data sources were the following: (1) paid CCS-authorized Medi-Cal claims; (2) counts of Medi-Cal eligibles by county, aid category, and month and year; (3) Medi-Cal

monthly eligibles by birth date; (4) health care plan by month; and (5) tabulations of total Medi-Cal expenditures. Sources for descriptive, non-Medi-Cal data included the California State Department of Finance and the U.S. Bureau of the Census.

Qualitative data on carve-out implementation and impact also were gathered to supplement the quantitative analysis. Interviews were conducted with CCS administrators in a subset of California counties to provide insight into the local context surrounding the managed care expansion and carve-out policy implementation.

Medi-Cal Claims and Enrollment

A natural source for information on CCS caseload volume would be Children's Medical Services in State DHS. However, while Children's Medical Services maintains statewide data on total CCS program participants, these data are not regularly updated for periods of a child's financial ineligibility. These data also are not updated for periods of medical ineligibility that may occur due to disease improvement or resolution or due to the episodic nature of some CCS qualifying medical diagnoses. Thus it is difficult to use these data to estimate total children with active CCS eligibility (i.e., those with a current CCS qualifying medical diagnosis who are in treatment). These data also share no common identifying number with the claims information maintained by the Medicaid agency, and often have multiple identifying Social Security Numbers. This makes a matched enrollment and Medicaid claims file (for purposes of identifying a CCS eligible cohort among child Medi-Cal beneficiaries) an inadequate source for this analysis.[25] Consequently an alternative source of data on claimants was required.

Paid CCS-authorized Medi-Cal claims

Children with CCS eligible medical diagnoses were identified from claims data provided by the Medical Care Statistics Section (MCSS) in the California State Department of Health Services. The approach to constructing the claims file is illustrated in **Figure 4.1, Original and constructed data files**, and described in the following paragraphs.

An authorization flag that is unique to CCS appears on Medi-Cal claims that CCS has authorized as a Treatment Authorization Request (TAR). Fee-for-service Medi-Cal claims for the specified period (1994-1997) were searched by MCSS to find all CCS-authorized claims during this period. Thus the data include all claims identified as CCS-authorized for any Medi-Cal beneficiary age 0 to 21 years (at the time of the service) receiving at least one CCS-authorized service between January 1, 1994 and December 31, 1997. While claims with service dates in the remaining months of 1997 and early 1998 were available when the dataset was created in November 1998, a last service date of December 31, 1997 was chosen to ensure that nearly all claims for services provided by that date are

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[25] A more detailed discussion of limitations to Medi-Cal and CMS data for purposes of identifying "active" CCS eligible children is provided in Coopers & Lybrand (1997).

submitted and complete.[26] This minimizes the likelihood of inadvertently excluding either adjustment claims[27] or incurred but not billed services for the study period.[28] It was determined that allowing a year between the last service date requested and the file generation date should be adequate to produce a complete claims file for this period. The file includes approximately 2.25 million claim records with service dates of January 1994 through December 1997 that were authorized by CCS for Medi-Cal beneficiaries between 0 and 21 years. The major categories of data elements in the claims file are illustrated in **Figure 4.1**. Unique claimants are identified by a county code, an aid category code, and by a nine digit Social Security Number (SSN). To protect confidentiality, the SSN was scrambled by MCSS in creating the dataset, using a specific rule for each digit.

Key limitations and characteristics of the CCS claims dataset include the following. First, the dataset includes all fee-for-service claims authorized by CCS for children with CCS eligible medical diagnoses. It does not include services that may have been related to a CCS diagnosis but not authorized by CCS. This does not undermine the integrity of the dataset with respect to most of the hypotheses of interest, given that the research questions focus on CCS authorized services. However, it does preclude any direct estimation of total fee-for-service Medi-Cal costs for children with CCS qualifying medical diagnoses. Second, claims for newborns prior to the time that they receive their own Medi-Cal identification number are linked with the beneficiary ID of the mother. SDHS allows approximately two months for a unique identification number to be assigned. All of the claims for these infants should appear in the file because according to SDHS, the birth date on the claim must be that of infant even when the mother's beneficiary ID is used (Klein/SDHS 1999).[29] Third, studies conducted by MCSS on claims submissions find that a small volume of claims may be paid or the original payment adjusted (up or down) more than one year after the service date. Thus there may be outstanding claims that could cause over or underestimation of total expenditures.

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[26] According to 1999 SDHS documentation, "providers have at least a full year to submit claims to the fiscal intermediary from the date services are rendered" and "once received, the claims could also be returned to the provider for missing or revised information, adding more time to the adjudication process" (Klein/SDHS 1999).

[27] Claims can be voided or adjusted after being paid. A voided claim results in the creation of an identical claim that has negative reimbursement and unit of service amounts so that the resulting tabulated amount is zero. An adjustment creates a claim record that voids the original claim but also adds the correct reimbursement and unit of service values (Klein/SDHS 1999).

[28] Based on analysis of past claims experience, SDHS Medical Care Statistics estimated that 98.2 percent of claims for service dates through December 1997 would be paid claims by July 1998 (which is 94 percent of all claims), and that 99.6 percent of payments for services through December 1997 would be paid claims by December 1998 (which is 97.5 percent of all claims) (personal communication, 1998).

[29] Specifically, claims for infants who are CCS eligible and do not yet have a Medi-Cal beneficiary identification number—and whose Medi-Cal services are thus associated with the mother's Medi-Cal Beneficiary Identification Code—should be included in the claims data. The birth date indicated on the claim along with the CCS authorization flag were the two criteria used to create the dataset.

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Figure 4.1 – Original and constructed data files
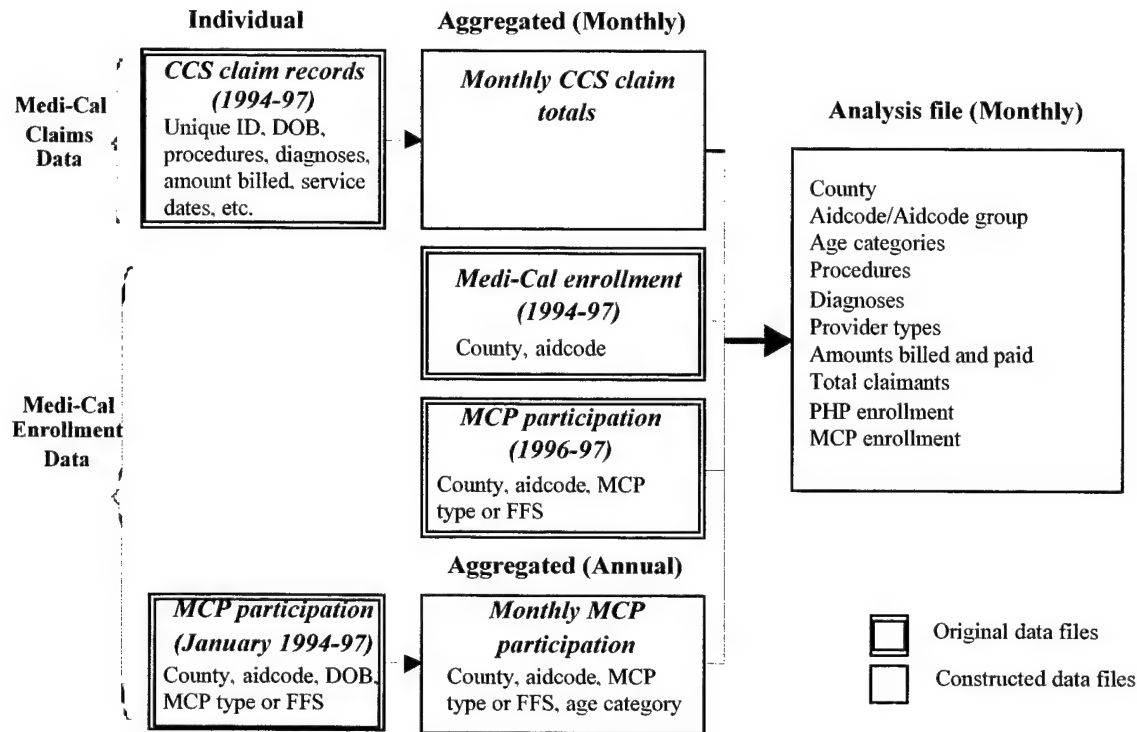
Two additional characteristics of the data were examined to understand their implications for the study analysis. These characteristics were the following: (1) claims with "negative" payments, and claimants who had one or more months of net negative expenditures, and (2) claimants who appeared to have claims associated with more than one aid category in a given month. **Appendix B** includes a detailed analysis of these characteristics and the conclusions drawn.

Counts of Medi-Cal eligibles by county, aid category, and month vs. year

Monthly Medi-Cal enrollment totals were procured from the Medical Care Statistics Section. MCSS provided extracts of the Medi-Cal eligibility files (the Medi-Cal Certified Eligibles File) for the 60 month period of January 1993 through December 1997. These extracts are monthly counts of Medi-Cal beneficiaries (termed "eligibles" by Medi-Cal). The total counts of persons enrolled in Medi-Cal for each month are stratified by Medi-Cal eligibility aid category and by county. These eligibility extracts do not further stratify the eligibility counts by age or any other characteristic.

As illustrated in **Figure 4.2, Impact of retrospective eligibility lag on Medi-Cal enrollment estimates for August 1998—By month used for estimate, and by Medi-Cal aid category,** generating Medi-Cal eligibility counts using this retrospective (lagged) approach is critical to

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representing the true number of eligibles in the given month. Enrollment estimates vary based on the number of months that elapse between the index month of eligibility and the date that the estimate is

Figure 4.2 – Impact of retrospective eligibility lag on Medi-Cal enrollment estimates for August 1998—By month used for estimate, and by Medi-Cal aid category
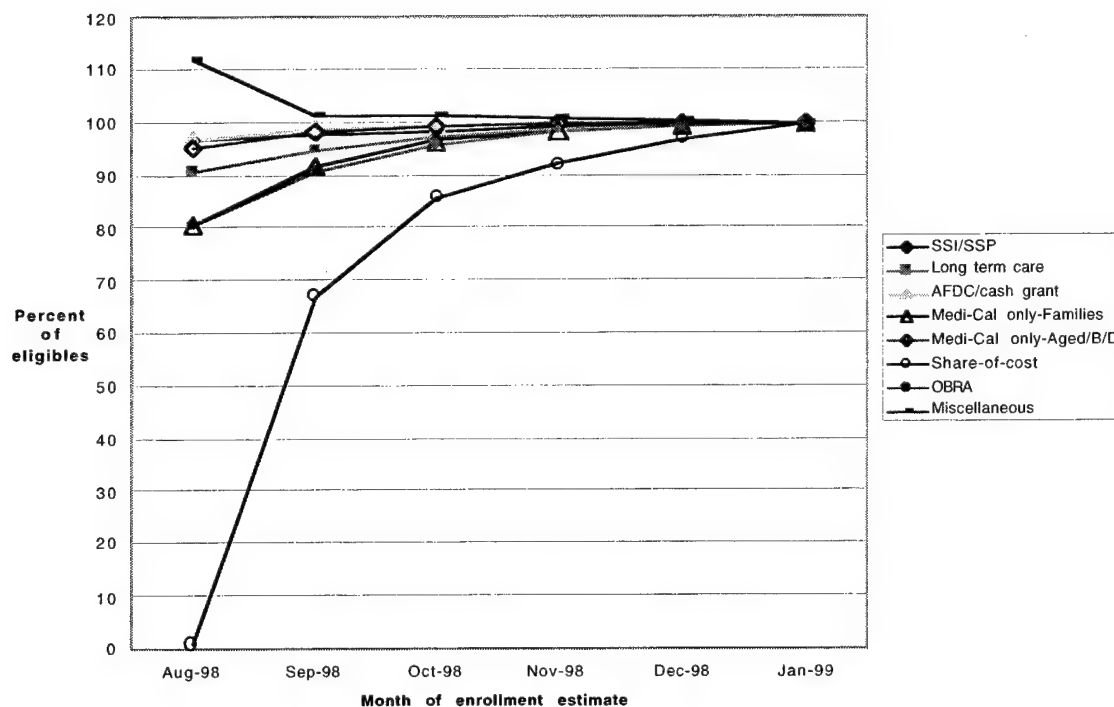
made. This figure shows how counts of those eligible in August 1998 (based on January 1999 data) change the closer to the index month the estimate is made. For example, for children and families who receive Medi-Cal because they receive AFDC/cash assistance, 98.8 percent of those eligible in the index month (August 1998) were identified as eligibles using data available in September 1998. In contrast, for individuals who receive Medi-Cal due to the family's low income, only 91.9 percent of those eligible in the index month were identified as eligible using September 1998 counts (MCSS 1999). However, when data on total eligibles based on information available to SDHS as of January 1999 were used, these counts were up to 100 percent and 99.6 percent respectively. Share-of-cost Medi-Cal eligibility is granted on a monthly basis after a certain individual spending requirement is met. This causes high retrospective eligibility counts with few of these eligibles identified immediately after the index month, as illustrated in **Figure 4.2**.

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Medi-Cal Monthly Eligibility file

The Medical Care Statistics Section provided more detailed eligibility extracts for the month of January, for the years of 1993 through 1998. These data provide an individual level record on every individual who had Medi-Cal eligibility during the month of January in the given year. These records including the following data elements: Medi-Cal eligibility aid category, county of residence, birth date, and prepaid health plan identification (code number) if enrolled in a prepaid health plan. This file permits analysis of Medi-Cal eligibility and enrollment data for each county based on beneficiary age, participation in managed care or FFS, and if managed care, the type of prepaid health plan. The data use lagged eligibility statistics, providing eligibility information for the month of January based on the full eligibility file six months later, so that retrospective eligibility determinations are counted within the counts of January eligibles.

Health Care Plan by Month file

This file includes monthly counts of Medi-Cal enrollees by county, eligibility aid category and prepaid health plan code (if enrolled in a PHP) for the calendar years 1996 though 1998. Like the Medi-Cal Certified Eligibles File extract, these data are in the form of monthly totals rather than individual records. This file is generated by MCSS from an extract of the Medi-Cal Eligibility file that was created six (6) months after each index month in the dataset.[30]

Medi-Cal expenditures

Data on Medi-Cal expenditures were drawn from several sources. Mean monthly fee-for-service expenditures for each calendar year are available in the Services and Expenditures Month-of-Payment Report from MCSS. Payments for CCS-authorized services are included in relevant line items that distinguish between service types and also are reported separately as mean monthly totals in a CCS line item. These data include statewide totals and also are stratified by county and by aid category groupings. Several eligibility aid categories such as SSI (aid category 60) have data reported separately while other aid categories (such as those associated with public cash assistance) are subsumed within groupings that include multiple aid categories. (The aid category groupings have some variation by year.) The Month-of-Payment Report excludes payments to prepaid health plans and to County Organized Health Systems. Payments to prepaid health plans are provided as annual totals and as per member per month (PMPM) capitation rates by prepaid health plan in another set of expenditure reports from MCSS and the Medi-Cal Managed Care Policy Division. Payments to Local Initiatives and Commercial Plans in Two Plan counties are also provided as annual totals and as PMPM capitation rates.

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[30] The exception is for calendar year 1996. The files for 1996 were created between 7 to 12 months after each index month because the archived monthly files had expired (MCSS documentation).

Data Sources for Descriptive Information on County Trends

Data on socioeconomic indicators for California counties were gathered for descriptive purposes and for potential use as covariates. Several data sources provided information on county demographic characteristics. These data sources included U.S. Bureau of the Census estimates of the total population (all ages) and child population (age 0 to 21 years), as well as estimates of the percent of children (by county) living under the federal poverty level (FPL). Additional data, such as the percent of each county's population enrolled in Medi-Cal, came from the Medi-Cal Annual Statistical Reports for calendar years 1994 through 1998.

4.2.2 Construction of the Analytic File

The analysis files were constructed for the multivariate models by merging a series of separate MCSS files. The analysis files include data elements on monthly claimants and services, monthly Medi-Cal enrollees, monthly prepaid health plan participation (for years 1996 and 1997 only), and annual prepaid health plan participation. The datasets are illustrated in **Figure 4.1** along with a profile of the merged dataset.

Decisions about Missing Data

As discussed earlier, **Appendix B** describes several characteristics of the claims data that may involve missing claims. Two other characteristics of some claims that clearly involved missing data elements are discussed here. A small number of claims were excluded from the CCS claims database based on (1) apparently invalid county indicators, and/or (2) Medi-Cal eligibility aid categories appearing on the claim (as part of the beneficiary ID) that appeared invalid. The scope of the missing data problems and the rationale for how the problems were addressed are provided below.

Claims that were missing a county indicator   A total of 21 claims were identified as having an invalid county code; these claims were assigned a county code of "59" and yet valid county codes in Medi-Cal claims data range from 1 to 58. Medi-Cal eligibility aid category information was missing (i.e., coded as "00") for all of these claims.[31] These claims were distributed across the study period. Four (4) of these claims were associated with 1994 service dates, ten (10) were associated with 1995 service dates, four (4) were associated with 1996 service dates, and three (3) were associated with 1997 service dates. The claims ranged in expended amount from $14 to $11,954. The total expended on these claims during the study period was $42,641, which represents only 0.0019 percent of the total amount expended during the study period of $2,225,551,364. Due to the small volume of these claims and the small expenditures, the impact of excluding these claims was deemed to be small.

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[31] The zip code of the provider for nine (9) of the eleven (11) beneficiaries associated with these claims was outside of the State of California. There were valid diagnosis codes associated with eight (8) of the eleven beneficiaries; the diagnoses (based on ICD-9 coding) were tibia and fibula fracture; aplastic anemia; malfunctioning vascular device and hydrocephalus; tibia fracture; nephritis; and respiratory failure.

Invalid coded aid categories in CCS claims file Few claims in the MCSS files were associated with a Medi-Cal eligibility aid category that appeared to be invalid. Aid categories were deemed to be "apparently invalid" if either of two criteria were met. The first criterion was that the aid category would not generally provide Medi-Cal eligibility (e.g., a social services aid category for which Medi-Cal eligibility is not issued). The second criterion was that the aid category did not appear in MCSS listings of current and past (defunct) eligibility aid codes in the Short Claims documentation, nor in listings of valid aid categories provided in the Medi-Cal program Annual Statistical Reports for the years of 1994 through 1997.[32]

A total of 5,886 claims were missing an aid category or were coded with an aid category that appeared invalid. These claims were associated with total expenditures of $7,530,750. This comprises 0.34 percent of all expenditures. The approximate annual totals were $1.4 million in 1994, $2.8 million in 1995, $2.4 million in 1996, and $0.8 million in 1997.

The impact of excluding these claims was considered along with the impact of including them. The decision to exclude was made because with an apparently invalid aid category, these claims could not be assigned to either a mandatory managed care participation group or a non-mandatory group for the analysis, which are the relevant groupings for evaluating carve-out impact. Because these aid categories appear invalid, it is difficult to say whether there is a relationship between the missing information and the predictor or outcome variables. It would be possible to determine whether there are other claims for the individual that do have a valid aid category. However, the reason for a child's Medi-Cal eligibility can change. Thus some error would be introduced in imputing an aid category based on eligibility information from another month of eligibility. Due to the small number of claims that were coded with an apparently invalid Medi-Cal eligibility aid category, it was decided that this subset of claims could be reasonably excluded from the dataset.

Aid categories excluded from Medi-Cal enrollment file Monthly counts of total Medi-Cal beneficiaries were obtained for each aid category. These monthly counts are used in the multivariate analyses to control for changes in the Medi-Cal base population over time. For those analyses that

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[32] Aid categories that were deemed to be apparently invalid include the following:

0	invalid (not a Medi-Cal aid category)
9	could be 09, but 09 confers eligibility for Food Stamps and not for Medi-Cal
A	could be an error and actually 0A, which is refugee cash assistance
00	invalid (not a Medi-Cal aid category)
05	severe emotional disturbance (SED) category for which no Medi-Cal issued
22	blind adult recipients of SSI/SSP, no Medi-Cal issued
31	receiving foster care services but no Medi-Cal issued
41	invalid (appears to be foster care)
4F	invalid (not a Medi-Cal aid category)
61	disabled group, no Medi-Cal issued
62	adult disabled, no Medi-Cal issued
84	a MI adult (21+) code that was discontinued in 1983
S2	invalid (not a Medi-Cal aid category)

use pooled aid categories with groupings of mandatory and non-mandatory managed care requirement status, pooling Medi-Cal enrollment from all Medi-Cal aid categories would include a number of categories that by definition cannot contribute to the CCS-eligible population. Aid categories that only include beneficiaries over 65 years of age comprise this group. As a result, trends in enrollment for individuals who are in these "non-CCS eligible producing aid categories" would affect the population base that is used as a control variable in predicting CCS claimant volume and expenditures. To minimize the impact of trends in non-base population enrollment, in analyses that pool counts of Medi-Cal beneficiaries across aid categories (i.e., when combining all aid categories conferring mandatory managed care participation status), those Medi-Cal aid categories that include only beneficiaries 65 years or above are not used to generate the counts.[33]

Defining the Base Population

The CCS claims data are by definition limited to Medi-Cal beneficiaries between the ages of 0 to 21 years. Most Medi-Cal eligibility aid categories (other than those limited to individuals over age 65, and foster care aid codes) include both child and adult beneficiaries. Because the monthly Medi-Cal eligibles file aggregates enrollment information for all individuals within a Medi-Cal eligibility aid category without age strata, the monthly figures capture enrollment trends not only for children in these aid categories but also for adults. An example is the aid category 60, which denotes receipt of Supplemental Security Income (SSI) benefits and aggregates child with adult beneficiaries. As a result, Medi-Cal enrollment for all ages must be used in the time-series analyses that require monthly data. However, MCSS does publish individual-level enrollment information for January of each year that includes birth date. Thus the month of January data for total enrollees can be compared with the month of January data for children 0-21 years for insight into how base population estimates are affected.

Total Medi-Cal enrollment may not be a good proxy for the true CCS base population. To understand the impact for base population estimates, the month of January data for all enrollees and for children 0-21 were compared. The results are illustrated in **Table 4.1, Trends in CCS claimants as a percent of Medi-Cal enrolled children 0-21 years and of Medi-Cal enrolled of**

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[33] Aid codes that expired some time during the study period (e.g., aid codes 51 and 52 for IRCA aliens that expired on 12/31/94) were not excluded from the analyses. The rationale is that such statewide changes will be accounted for in the estimations that compare groups and counties. It is possible that these changes (as well as uptake in new eligibility aid codes) could differentially affect specific counties, and mandatory vs. voluntary/exempt eligible groups and thereby be captured in the carve-out effect estimations.

Table 4.1 – Trend in CCS claimants as percent of Medi-Cal enrolled children 0-21 years and of Medi-Cal enrolled of all ages: Selected aid categories and expansion counties, Month of January

County	Aidcode 30 (cash aid) CCS claimants as % of Medi-Cal (0-21 years) CCS claimants as % of Medi-Cal (all ages)					Aidcode 34 (no cash aid) CCS claimants as % of Medi-Cal (0-21 years) CCS claimants as % of Medi-Cal (all ages)					Aidcode 60 (SSI) CCS claimants as % of Medi-Cal (0-21 years) CCS claimants as % of Medi-Cal (all ages)				
	1994	1995	1996	1997	1998	1994	1995	1996	1997	1998	1994	1995	1996	1997	1998
Alameda	0.19%	0.20%	0.19%	0.30%	0.31%	0.39%	0.42%	0.32%	0.33%	0.49%	7.5%	7.5%	7.2%	8.5%	8.6%
	0.14%	0.15%	0.13%	0.21%	0.22%	0.24%	0.26%	0.21%	0.21%	0.32%	0.7%	0.8%	0.8%	1.0%	1.0%
Contra Costa	0.13%	0.14%	0.23%	0.21%	0.22%	0.07%	0.32%	0.35%	0.36%	0.40%	6.5%	7.8%	7.4%	8.0%	5.4%
	0.09%	0.10%	0.16%	0.14%	0.16%	0.05%	0.20%	0.22%	0.23%	0.25%	0.7%	0.9%	1.0%	1.1%	0.8%
Fresno	0.10%	0.07%	0.11%	0.11%	0.27%	0.22%	0.19%	0.28%	0.26%	0.51%	6.8%	7.6%	5.6%	7.4%	9.6%
	0.08%	0.06%	0.08%	0.08%	0.22%	0.14%	0.12%	0.18%	0.16%	0.36%	0.9%	1.1%	0.8%	1.2%	1.5%
Kern	0.12%	0.08%	0.13%	0.27%	0.21%	0.17%	0.16%	0.22%	0.34%	0.34%	4.0%	4.2%	3.7%	5.7%	6.5%
	0.09%	0.06%	0.10%	0.20%	0.15%	0.11%	0.10%	0.14%	0.21%	0.24%	0.6%	0.6%	0.6%	1.0%	1.2%
Los Angeles	0.17%	0.16%	0.20%	0.16%	0.14%	0.43%	0.38%	0.46%	0.40%	0.39%	9.1%	9.9%	10.6%	10.9%	9.5%
	0.13%	0.12%	0.15%	0.12%	0.10%	%0.30	%0.27	%0.32	%0.28	%0.28	1.0%	1.2%	1.4%	1.5%	1.4%
San Francisco	0.24%	0.14%	0.20%	0.30%	0.28%	0.35%	0.22%	0.43%	0.59%	0.46%	9.0%	7.0%	7.7%	10.4%	9.9%
	0.21%	0.13%	0.26%	0.37%	0.29%	0.21%	0.13%	0.26%	0.37%	0.29%	0.43%	0.37%	0.43%	0.59%	0.53%
Tulare	0.10%	0.10%	0.15%	0.15%	0.15%	0.17%	0.19%	0.22%	0.25%	0.25%	6.1%	8.7%	7.2%	8.9%	8.5%
	0.08%	0.08%	0.11%	0.11%	0.11%	0.11%	0.12%	0.14%	0.16%	0.17%	0.7%	1.1%	0.9%	1.2%	1.2%

all ages: Selected aid categories and expansion counties. CCS claimants as a percent of the Medi-Cal counts for all ages and for children 0-21 years are shown for several large aid categories in several different expansion counties. The rates and the percent changes from year to year are provided for all beneficiaries and for child beneficiaries in Medi-Cal.[34] This table shows that for aid categories 30 (cash assistance) and 34 (low-income families without cash assistance), total enrollees and child enrollees show similar trends in rate change from year to year. This was expected because these aid codes largely include mothers and children. Children comprise 70 to 75 percent of all Medi-Cal enrollees in aid category 30, and children comprise 60 to 70 percent of all Medi-Cal enrollees in aid category 34. In contrast, children comprise only 5 to 15 percent of Medi-Cal enrollees in aid category 60 (SSI). For this SSI-linked aid category, the rates using total enrollment and the rates using child enrollment diverge. Annual rate changes for the month of January from 1995 to 1998 are +1 percent, -5 percent, +18 percent, and +1 percent for children 0-21 years and are +15 percent, +5 percent, +25 percent, and +3 percent of the SSI aid category using all ages. SSI may be a more dynamic eligibility aid category than the other aid categories in which children do not predominate. Overall, these rates suggest that total Medi-Cal enrollment is an imperfect proxy for the actual base population.

Identification of Descriptive Information on Counties

Appendix A.3, **Socioeconomic characteristics of counties**, presents the socioeconomic characteristics of California counties, grouped by their study status (study counties, managed care expansion/carve-out comparison counties, and non-managed care counties) with subtotals by study status group and statewide. Specific characteristics include the total number and percent of children 0-21 years in the baseline year of 1994 and the percent annual change between the years of 1994 and 1997; the percent of children 0-18 years living below the federal poverty level (FPL) with baseline for 1993 and the percent change between 1993 and 1995; and per capita personal income for the years 1994, 1995, and 1996.

4.2.3   Analytic Strategy

The purpose of the study is to answer the following questions: (1) whether the carve-out policy increased the number of child Medi-Cal beneficiaries who are identified as having CCS eligible medical diagnoses; (2) whether the policy affected the diagnostic composition of CCS program participants through the new CCS case-finding incentives; and (3) whether the policy caused CCS expenditures to increase (the "cost-shifting" effect). One primary hypothesis is that the volume of children with CCS-authorized service claims increases following the carve-out. A second primary hypothesis is that cost-shifting practices following the carve-out cause CCS expenditures to

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[34] This table was constructed to illustrate the volume of children 0 to 21 years as a proportion of all enrollees, using month of January data for years 1994 through 1998, and also to illustrate the children with a January CCS claim as a percent of all enrollees, in several large aid codes. Two columns (percent difference in child enrollees, percent difference all enrollees) show the percent change from January of each year to the following year for children 0 to 21 and adults, respectively.

increase. The specific methods by which each of these questions will be examined are described in detail in the following section.

It is important to note that this study focuses on CCS participation and on CCS-authorized services in the fee-for-service system. It is not intended to—and cannot—evaluate the impact of the carve-out policy on the total volume and the types of medical services that child Medi-Cal beneficiaries receive. This is because services *not* captured in the CCS claims data are those that are (1) not billed to CCS; (2) paid on a fee-for-service basis by Medi-Cal but not authorized by CCS; or (3) provided and/or covered within a capitated rate.[35]

Specific Aims and Hypotheses

This section describes the specific aims and hypotheses of the study and outlines the basic approach to analyzing these questions. The specific analysis plans for these hypotheses are described in more detail in the following section.

Aim 1 Determine whether the financial incentives of a carve-out policy increase case-finding of children with Title V-eligible conditions.

When a capitated prepayment system goes into effect with a service carve-out, theoretically this creates a financial incentive to maximize the proportion of services that can be reimbursed on a fee-for-service basis, outside the capitated rate. This creates an incentive to refer children with CCS eligible medical diagnoses to the CCS program. For children who already are identified as having a CCS qualifying medical diagnosis, the financial incentive would theoretically stimulate providers to submit claims for medical services provided to the child as CCS-related whenever possible.

Hypothesis 1: The number of children with at least one CCS-authorized Medi-Cal claim will increase following the carve-out relative to the pre-carve-out period and to the comparison counties.

The cost-shifting effect is expected to increase total CCS participation. It also is expected on average to increase the volume of services identified as CCS eligible for any CCS participant. The combined effect hypothesized is an increased number of children who have at least one CCS authorized claim in a given time period.

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[35] Only those claims authorized by CCS are available for this analysis. These claims do not reflect all medical services provided to the children through the Medi-Cal program. Also, encounters for children when they are enrolled in prepaid health plans are not part of the Medi-Cal claims history for beneficiaries so even a search for all claims for identified beneficiaries would not produce a complete claims history. Finally, like all studies based only on claims information (and particularly as a study based on Medi-Cal for which payment rates are very low and the paperwork involved burdensome), there can be a difference between what is billed and what is provided.

Children who have CCS qualifying medical diagnoses and do not receive CCS-related services in a given time period will not be observed in claims data. The probability of a known eligible child getting at least one service cannot be compared across the different groups or counties without an estimate of the denominator, as indicated in Duan et al (1983) and Manning et al (1987). As a result, the per-child change in services cannot be measured directly.

Children newly identified as CCS eligible cannot be directly observed in the claims data. An objective of the analysis is to identify the "excess" number of children identified with CCS qualifying medical diagnoses due to the carve-out. A potential measure of the carve-out effect would be the total number of children newly identified to CCS monthly over the course of the study period. It would be ideal to know the number of children newly identified by CCS as medically eligible over time, and to compare these numbers over a series of months and years prior to and following the carve-out. However, the claims data do not permit children to be defined in this way. Because even a child without previous claims in the analysis file may have been known to CCS, the number of "new" eligibles cannot be estimated.[36] A number of CCS qualifying medical diagnoses such as seizure disorders, or conditions requiring multiple surgeries as the child grows, have an episodic nature and are expected to lead to periods of time without claims related to the CCS condition.

Data do not permit a measure of changes in service use at the individual level to capture the carve-out effect (e.g., tracking the volume of claims for specific children over the course of the study as a survival analysis). Their Medi-Cal eligibility is only known for the months in which they have one or more CCS-authorized claims. The general analytic approach is to use county totals of claimant activity as the level of the analysis, rather than individual level changes in claim activity.[37] The total number of children with one or more CCS authorized claims can be compared between the pre and post carve-out periods.

To summarize, counts of total CCS claimants are evaluated for the months prior to and following the carve-out. "CCS claimants" are defined as Medi-Cal beneficiaries with one or more CCS claims over a certain period of time (e.g., month). The reason for referring to the children grouped in this way as CCS claimants rather than as all CCS eligibles—or as all children with CCS qualifying diagnoses known to CCS—is that not every child with a CCS condition will necessarily have one or

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[36] Additionally, the potential "look-back" period for previous involvement with CCS varies by beneficiary because there is no claims history available for children who are first identified in the claims database in early 1994, and nearly four years of claims history available for children who are first identified in the database in late 1997.

[37] The difficulty in distinguishing which beneficiaries are actually "new eligibles" and which beneficiaries had CCS eligibility in the past followed by a period of no claim activity stems from the fact that children with no CCS claims in a given period are not observed in the claims data. Typical problems in estimating program impact for individuals—such as migration effects that cannot be observed from the claims data—are not a problem when the unit of analysis is claimant volume at the aid category group or county level with the outcomes of interest thus at the population rather than the individual level.

more claims in a given month. The term "CCS claimants" captures the relevant outcome because the research focuses on the number of children identified as CCS eligible who have authorized claims.

Hypothesis 2: Increased case finding will cause a change in the distribution of CCS diagnoses associated with services.

Prepaid health plans and providers in managed care expansion counties have an incentive in the post carve-out period to refer children to CCS. This incentive is expected to cause an increase in total CCS participation in expansion counties relative to non-expansion counties and relative to the pre-expansion period. The incentive also may cause a shift in the total distribution of CCS medical diagnoses toward conditions of lower severity or intensity. The increased case finding would be expected to identify a disproportionate number of lower severity and less costly CCS cases, on average.

Aim 2 Determine whether carving out specialty services increases total fee-for-service CCS expenditures and per claimant expenditures.

Hypothesis 3: Expenditures on FFS CCS specialty services will increase in the post-carve-out period.

The carve-out of CCS services enables providers to shift costs from their prepaid, capitated arrangements to fee-for-service Medi-Cal. Total fee-for-service expenditures authorized by CCS for specialty care are expected to increase after the carve-out relative to what they would have been.

Hypothesis 4: The change in the distribution of CCS conditions due to increased case finding will cause the mean expenditures per CCS claimants to be lower in the post-carve-out period relative to the pre-carve-out period.

The referral incentive also may cause a shift in the total distribution of CCS medical diagnoses toward conditions of lower severity or intensity, and/or a shift in the distribution of services authorized by CCS to those of lower intensity, as measured by average expenditure. If increased services per known claimant dominates the effect, then mean expenditures per claimant could increase. However, it is expected that mean expenditures per claimants will decline with an increase in CCS program participation, and with an increase in a known CCS participant's likelihood of having a claim in a given month. The "composition" effect may occur in addition to the shifting of costs from the prepaid to the fee-for-service system that causes an increase in CCS expenditures (a "prepayment" effect). It is possible that compositional changes may take place with no overall impact on the distribution of expenditures.

General Approach: A Natural Experiment

A set of "natural experiments" within the state permits comparison of CCS program participation and expenditures without a carve-out in effect, to CCS program participation and expenditures once

a carve-out is in effect. Implementation of the carve-out and managed care expansion were illustrated in **Figure 3.8** along with the pre and post periods that will be analyzed by county. The comparison groups are those illustrated in **Figure 3.5, Figure 3.6, and Figure 3.7** (and outlined in **Table 1.1**).

The managed care expansion counties are those that are expected to be affected by the carve-out policy. As illustrated in **Table 3.3**, the study focuses on twelve (12) Two Plan Model counties and two (2) COHS counties operating under the carve-out. These 14 counties are a subset of the 20 California counties that are operating some form of expanded, mandatory Medi-Cal managed care systems (Two Plan Model, COHS, or GMC). Of the other six (6) expansion counties, four (4) are COHS counties that are not operating under the CCS carve-out policy and also do not contribute complete CCS authorized claims data (San Mateo, Santa Barbara, Solano, and Napa counties). These four counties are not included in the analyses. The remaining two (2) counties are operating the GMC model. One of these counties (Sacramento) has a mixed system with an operational CCS carve-out for most but not all of the contracting Medi-Cal managed care plans. The other county (San Diego) has a unique GMC system that was not operational until the end of the study period. In San Diego, the carve-out was operational in one health plan as of April 1997 but did not become effective in several other health plans until July 1998 (two plans) or August 1998 (four plans). Finally, as outlined in **Table 3.3**, an additional two counties are identified as having managed care because they are piloting the use of physician case management fees to support a utilization review function in a fee-for-service/managed care network (FFS/MCN) model.

Within the set of 14 expansion counties, four counties are identified as early implementing counties. These early implementing managed care expansion/carve-out counties are distinguished from other expansion counties by the length of observation time available in both the pre and post periods. The study period of 1994 through 1997 provides two years of post-carve-out data in Orange County, nearly two years of post-carve-out data in Alameda County and in Santa Cruz County, and one year of post-carve-out data in Kern County. (Two of the early implementation counties—Alameda and Kern—each have two "carve-out" dates because they have competing managed care systems. These dates are four months apart in Alameda and two months apart in Kern.) The remaining 10 Two Plan model counties complete this group.

There are 36 non-expansion counties in California. Three (3) of these counties are non-expansion counties with some voluntary participation in Medi-Cal prepaid health plans over the course of the study period. The other 33 counties are non-expansion counties with no prepaid health plan participation.

Comparison Groups

In addition to pre and post carve-out comparisons, trends are compared between the mandated and non-mandated groups to measure the carve-out effect. Medi-Cal beneficiaries in aid categories that confer mandatory managed care participation comprise the group that is directly exposed to the carve-out effect. As previously described, managed care with the carve-out is mandatory for the

largest group of child Medi-Cal beneficiaries. This group includes children who qualify for Medicaid eligibility based on receiving cash assistance or based on certain categorical eligibility groups. Other children who are receiving Medicaid due to other eligibility criteria can enroll voluntarily in prepaid health plans. These beneficiaries include those children who are eligible for Medicaid based on receiving disability-based cash assistance (i.e., SSI), are in foster care and receiving Title IV-E payments, and who have share-of-cost (SOC) Medi-Cal eligibility or receive restricted Medi-Cal benefits, among others. (A categorization of Medi-Cal eligibility aid codes by mandatory and voluntary managed care status was provided in **Appendix A.1**).

Non-experimental assignment to mandatory managed care requirement

There are several ways in which the different groups being compared are not experimentally assigned to the mandatory managed care participation requirement. Different analyses performed within the natural experiment design are based on comparisons across counties, comparisons across county models, and comparisons across eligibility aid categories that are pooled into mandatory and non-mandatory groups. As discussed in Chapter 2 and summarized below, counties in California were not randomly assigned to a managed care expansion group (e.g., Two Plan Model, COHS, GMC, non-expansion voluntary managed care, non-expansion with no managed care). Moreover, the occurrence of implementation delays was not random but instead was associated with county characteristics—some known and some unknown. Finally, child Medi-Cal beneficiaries are not assigned randomly to counties (and thus to county model) nor (most importantly) randomly assigned to a specific Medi-Cal eligibility aid code and thus to a managed care participation group (mandated, non-mandated, excluded). These different levels of non-experimental assignment—managed care expansion model to county, children to mandatory managed care group—are addressed through a combination of model specification and contextual analysis. The consequences of the non-experimental assignment at these different levels are discussed below and addressed again in the findings and conclusions of the study.

Non-experimental assignment of counties to managed care models   While the study design takes advantage of the staged implementation of mandatory managed care across counties in California, and also includes some comparisons between COHS counties and Two Plan model counties, a critical fact for the analysis is that counties were not assigned to specific managed care expansion characteristics experimentally. That is, a particular county's status—as defined by scope of implementation (model design), timing of implementation, length of transition, and managed care participation rates among those eligible for participation—is the consequence of specific county characteristics, of events that transpired during implementation, and of SDHS policy decisions and HCFA interventions both prior to and during the managed care expansion. Neither the selection of counties to a managed care model, nor the timing of any given county's managed care implementation, occurred as part of an experimental process.

The first aspect of non-random assignment has to do with what model a given expansion county implemented. For example, unlike the counties that are implementing the Two Plan Model, Orange County (which is a COHS model county) had most Medi-Cal services provided within the private

sector and did not have a public (county) hospital. California also reached a limit on the number of COHS systems it could implement and thus was constrained in its implementation options for subsequent expansion counties. These and other relevant factors are discussed more fully in Chapter 2 and are highlighted again where relevant in the analyses that follow.

The second aspect of non-random assignment has to do with the timing of implementation across the expansion counties. The expansion counties implemented their managed care systems on different dates and experienced transition periods (e.g., the stages of partial implementation through full implementation with operational default of Medi-Cal enrollees into managed care plans) of different lengths due to factors that are inexorably linked to county characteristics. A number of the factors associated with the initial implementation date and the length of the transition period can be identified and elaborated through the documentation associated with HCFA's oversight of the expansion. They also have been described in several policy reports issued on California's implementation (GAO 1997; Medi-Cal Community Assistance Project 1997). A review of published documents on California's implementation identifies several types of factors and events that affected the timing of implementation (and more specifically, variation in timing across counties, rather than state-level delays that caused the same effect in all expansion counties). These include the following: problems with the specific contracting prepaid health plan(s) in a county; population needs (e.g., primary language other than English or Spanish); and county size.

These factors are complex and thus difficult to characterize and model quantitatively. Further, the relatively small number of counties being studied limits the degrees of freedom. Several analytic approaches are taken to recognize and/or to address this non-experimental assignment. First, county fixed effects are used to represent the expected differences across counties, in models that combine observations from multiple counties.[38] Second, not all analyses combine counties as if they belong in a common group with the assumption of common experience with the carve-out. Finally, the qualitative interviews across counties (discussed later in this section) are used to characterize some of the potential differences that may have affected response or impact of the carve-out, as identified by CCS staff, so that at minimum the findings of the analyses can be placed in context and the appropriate caveats outlined.

Non-experimental assignment of child Medi-Cal beneficiaries to aid codes and to managed care requirements Some of the analyses pool beneficiaries in different Medi-Cal aid codes into the mandated and non-mandated/excluded groups to compare the change in relevant outcomes (e.g., claimant volume, expenditures) observed in mandated groups to the change observed in the voluntary/excluded groups. The Medi-Cal program has many classifications of eligibility that differ widely in terms of the reason for eligibility (e.g., receipt of cash assistance, receipt of cash assistance

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[38] As discussed in Chapter 2, California counties are each assigned to one of seven Medi-Cal field offices. If policies and procedures vary by Medi-Cal field office in a way that affects program outcomes, then this is another source of systematic variation. Each of the seven Medi-Cal field offices is responsible for at least one of the managed care expansion counties. Each of the seven Medi-Cal field offices also has responsibility for at least one of the 36 non-expansion counties.

for disability, poverty, foster care status, medical need). These eligibility classifications are not randomly assigned to the Medi-Cal managed care requirements. In fact, Medi-Cal eligibility aid categories were purposefully selected for managed care participation (and thus for "non-participation" or exclusion) based on a set of explicit criteria. These criteria include eligibility for full scope Medi-Cal (i.e., no restrictions on the benefits conferred to the beneficiary); no cost-sharing requirements (i.e., Medi-Cal eligibility is only conferred for the month if specified medical expenditure threshold has been reached by the family/by the child); and a reason for receiving Medi-Cal that is not linked to receiving federal payments based on foster care status, or to receipt of cash assistance related to a disability (i.e., SSI).[39]

Several approaches are taken to address this non-experimental assignment. These approaches, which all are discussed below, include the difference-in-differences approach and the association between a continuous measure of managed care participation and the outcomes of CCS expenditures and program participation.

Selection of a comparison group

An important question was whether the 36 non-expansion counties were an appropriate comparison group for the expansion counties. The purpose of the comparison group is to show whether any post carve-out trend was actually part of a common time trend. If the comparison group has a different time trend throughout the study period, then it is less useful in identifying a carve-out effect. Because SDHS selected counties purposefully for expansion based on county characteristics, the smaller counties may not represent what would have occurred in the expansion counties, absent the carve-out policy.

Several comparison groups were considered as alternatives to the full complement of 36 non-expansion counties.[40] A subgroup of counties was sought with greatest possible equivalence to the expansion counties on proxies for health system characteristics (e.g., urbanicity, population size). A subset of non-expansion counties that is most appealing conceptually is the eight non-expansion counties that operate independent CCS programs. This implicitly includes size, and all expansion counties also operate CCS programs. The urban-rural continuum (U.S. Department of Agriculture 2000) rates counties on a scale of 0 to 9 based on degree of urbanization (presence of large urban center), being physically adjacent to a metropolitan county, and contribution to the metropolitan

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[39] As cited in a GAO report (1995), SDHS targeted beneficiaries in AFDC and AFDC-related aid codes to increase health care access to the largest number of beneficiaries possible, and expected to identify ways of implementing managed care for other Medi-Cal beneficiaries through special projects.

[40] The eight non-expansion independent CCS program counties are Butte, Humboldt, Marin, Mendocino, Merced, Monterey, San Luis Obispo, and Ventura. The six non-expansion matched urban continuum counties are El Dorado, Madera, Marin, Monterey, Ventura, and Yolo. The eleven counties in both of these groups are Butte, El Dorado, Humboldt, Madera, Marin, Mendocino, Merced, Monterey, San Luis Obispo, Ventura, and Humboldt.

county's labor force.[41] The Two Plan expansion counties have urban-rural continuum scores ranging from 0 (having a metropolitan area with over one million people, such as Los Angeles) to 2 (such as Kern). Six of the 36 non-expansion counties have scores in this range.

Presence of a common pre-carve-out time trend for the expansion counties and comparison group was examined empirically. A linear regression of claimant volume using the final specification included year interaction terms to show whether the expansion (Two Plan, COHS) and comparison counties had a common time trend in the pre carve-out years of 1994/95. For each possible subgroup, if the interactions were not jointly significant, then it was assumed that the lack of time trend difference in 1994 and 1995 would have continued throughout the study period, in the absence of the carve-out. This depends on being able to detect significant differences using the year interaction terms.

Each of these three groups was used (in addition to the initial comparison group of 36 counties) to test for a pre-carve-out time trend in claimant volume. Regression results are provided in **Appendix C**. A significant coefficient for the 1995*non-expansion county interaction term in the mandatory group (-0.18, $t=1.93$) suggested that in fact, the 36 counties experienced a different time trend than the Two Plan counties during 1994-1995. (Three year interaction terms using the four six-month intervals in 1994 and 1995 were jointly significant for the mandatory group ($F(3,47)=3.0$, $p=0.04$) and for the non-mandatory group ($F(3,47)=2.3$, $p=0.09$)). The six counties matched by urban continuum scores suggested a possible difference in 1994/1995 time trend relative to the Two Plan counties (-0.19, $t=1.65$ for the mandatory group and 0.08, $t=1.16$ for the non-mandatory group). Year interactions were not significant for the 8 independent counties (-0.03, $t=0.33$ for the mandatory group; 0.01, $t=0.11$ for the non-mandatory group). This held for both the mandatory and the non-mandatory groups. Several specifications of the multivariate model were used to test this (using year interactions, and using semester interactions). Thus it appeared that the 8 independent counties were a reasonable comparison group for claimant volume in the Two Plan counties. A final consideration was the loss of observations and consequence for precision in estimating coefficients. Thus another group of 11 comparison counties was created with the 8 independent counties and the 6 counties with an urban-rural continuum score that matched the range found for the Two Plan counties. The hypothesis of a different time trend for the expansion and the 11 non-expansion counties was tested and rejected. Coefficients for year interactions were –0.11, $t=1.11$ (mandatory group) and 0.02, $t=0.22$ (non-mandatory group) for claimant volume. A 1994-95 time trend difference for expenditures was suggested but was not significant (-0.23, $t=1.08$ for the mandatory group and 0.11, $t=0.831$ for the non-mandatory group).

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[41] Specific criteria used to classify counties are based on a 1993 Office of Management and Budget (OMB) definition, and include having at least 2 percent of the employed labor force commute to the metropolitan area. An alternative measure of metropolitan status—urban influence codes, which are based on population size of the cities within the county—would have added Shasta and Sutter counties, and would not have included Humboldt County.

Modeling the Policy Change

The study evaluates caseload volume and expenditures over time. Some comparisons distinguish between two time periods. The pre carve-out period is defined as those months prior to any participation in the expansion managed care plans operating under a CCS carve-out. The post carve-out period is defined as those months in which one or more of the managed care plans were operational in a county. A transition period just prior to and following the carve-out could be examined separately to investigate whether there may be anticipatory effects and/or or a post-carve-out learning curve that dampens the initial response in the counties.

Descriptive analysis The first set of analyses are descriptive in nature. Trends in program participation (as represented by total claimants) and expenditures are compared between expansion counties and non-expansion counties. First, monthly differences in program participation and expenditures are evaluated for each expansion county and for the comparison counties. Second, selected outcomes for each of the carve-out counties and for the comparison counties are derived for the pre carve-out period, and the post carve-out periods between 1994 and 1997. The pre-post differences in the mean values also are tabulated. Caseload characteristics in the carve-out and comparison counties are compared, including diagnosis characteristics of children with CCS authorized services, and caseload size. Tabulations also are provided of changes in total expenditures and expenditures by service category.

Difference-in-differences estimation of the carve-out effect   A pre-post evaluation design has limitations in this study. Health system changes occurring over the four year study period could cause changes in costs and utilization that should not be attributed to the policy effect of interest. Control variables representing such changes are difficult to define and operationalize. Moreover, use of multiple control variables also absorbs degrees of freedom in the multivariate regression models. Consequently the preferred approach where possible is to employ a comparison group that is affected by similar time trends as the expansion counties, but unaffected by the carve-out policy.

A difference-in-differences model is one way to estimate the effect of the carve-out on CCS claimants and on fee-for-service CCS expenditures. This estimation approach controls for common statewide trends that could lead to changes in program participation or expenditures during the time period under study. The difference in these outcomes over time in counties that have not implemented the carve-out is used to control for statewide, time series trends that affect the CCS outcomes. For example, changes in health care technology and in practice patterns unrelated to the carve-out policy—such as substitution of outpatient care for inpatient care/hospitalizations—could certainly affect expenditures over time across the state. When aid codes are pooled into mandatory and non-mandatory categories for comparison, CCS program changes that affect both groups are differenced away. Assuming that there are no other significant exogenous shocks occurring simultaneously with the managed care expansion/carve-out, this approach results in a difference-in-differences estimate that captures the effect of the carve-out.

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Table 4.2, Difference-in-differences estimates of carve-out effect, illustrates a difference-in-differences model for the effect of the carve-out policy on study outcomes (in a table format used in Rogowski, Karoly, Klerman et al 1998). This model is applicable to all of the study outcomes (e.g., monthly claimants, monthly expenditures). For example, a model to examine changes in monthly claimants includes the following variables. β_0 measures the mean CCS claimant volume in the comparison counties prior to the carve-out policy implementation. $\beta_0 + \beta_1$ measures the mean in the expansion counties prior to the carve-out, and thus β_1 represents the baseline (pre carve-out policy) difference between the comparison and the expansion counties. The pre-post difference in mean claimant volume for the comparison counties is represented by β_2, which captures the effect on costs and enrollment from technology change and other long-term trends. The pre-post difference in mean claimants for the expansion counties is represented by $\beta_2 + \beta_3$ (capturing the pre-post difference that occurs across all counties as well as the unique difference attributable to the carve-out policy, β_3). The carve-out effect is thus represented by the difference-in-differences estimator, β_3.

Table 4.2 – Difference-in-differences estimates of carve-out effect

	Pre Carve-out Policy	Post Carve-out Policy	Difference
Comparison counties	β_0	$\beta_0 + \beta_2$	β_2 (pre-post in comparison counties)
Carve-out/ expansion counties	$\beta_0 + \beta_1$	$\beta_0 + \beta_1 + \beta_2 + \beta_3$	$\beta_2 + \beta_3$ (pre-post in expansion counties)
Difference	β_1 (difference at baseline)	$\beta_1 + \beta_3$ (difference at baseline plus policy effect)	β_3 (difference-in-difference estimator)

Time trend variables can be included in the model specification to represent changes over time in eligibility, in authorization protocols, or in other features applicable to all beneficiaries in the specifications. In general, trends over time that are common to all groups being compared—such as in mandatory and non-mandatory Medi-Cal managed care participation groups, and in managed care expansion and non-expansion counties—would be expected to be differenced out of the DD model.[42] In summary, the difference-in-differences estimator captures the difference between the counties that have not implemented the carve-out and the counties that have implemented the carve-out. Each measure (coefficient) and the significance of the combined measures (coefficients) can be

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[42] It is possible, however, that such changes have a greater impact on certain beneficiaries more than on others, and if these beneficiaries tend to cluster in the mandatory or non-mandatory groups, then these changes could be captured inadvertently in the carve-out estimator.

tested to determine whether they are significantly different from zero, and whether the signs of the coefficients are in the hypothesized direction.

An advantage of the difference-in-differences approach is that it directly compares pre and post means of the outcome variable, adjusting for other covariates. This approach is appealing because it treats the impact of the carve-out policy as an exogenous shock. The new financial incentives, physician referral practices, and Medi-Cal and CCS protocol changes that may result from the policy are treated as effective as of the carve-out date. A specification using a single post carve-out indicator variable captures the likely impact in COHS counties, which enrolled nearly 100 percent of mandatory group eligibles into managed care within a short time period.

The later months of post-carve-out period may represent a more "steady state" experience with the carve-out policy, however.[43] The comparison of means provided by the difference-in-differences specification does not account for the carve-out as occurring within a staged, gradual implementation. Alternatively, a set of dummy variables could be used to capture the effect of the carve-out, using time since implementation or other criteria to distinguish hypothesized start-up and steady state periods. The rationale for this specification is that in most managed care expansion counties, managed care participation increased gradually. In contrast, the single pre-post difference-in-differences estimates treat a group of claimants or beneficiaries as "exposed" to the particular condition as of a given date. Multiple county and time period interaction terms would be required to capture a gradual change within a DD framework. The approach of using multiple sets of dummy variables has the advantage of accommodating stages and not assuming linearity in policy impact, but it also consumes more degrees of freedom than the simpler pre-post set of comparisons used in the DD model. It also requires assumptions about what specific time periods are meaningful for different stages of the carve-out effect.[44] The growth rate in MCP participation ("uptake") in expansion counties was not only gradual but also varied from county to county.

There is a rationale for estimating carve-out impact separately for an initial and later phase of implementation. Because of the way that managed care implementation proceeded in the Two Plan counties, the Post period for these counties can be seen as composed of two phases, rather than one. The first few months after enrollment in any Medi-Cal managed care plan was permitted comprises the first period—during this period of voluntary managed care participation, one plan was operational and the second plan was not. Among the Two Plan counties, the first phase ranged from 1 month to 16 months in the study period, with mean of 7 months. The second phase includes all subsequent months during which both plans were operational and the default process (i.e.,

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[43] Another issue with the pre-post comparison approach is that the counties implemented their mandatory managed care systems at different times during the study period of 1994 to 1997. The calendar months used to define pre and post periods are not the same for each county.

[44] The use of time trend control variables in the difference-in-differences approach also may introduce difficulty in interpreting the results because each variable operates as an intercept-shift. Depending on the timing of a county's managed care expansion, the time trend variables might capture or distort the difference-in-differences estimators (as county-specific dummy variables).

automatic assignment to a health plan, absent a choice by the beneficiary) was in place for any beneficiaries who did not select a health plan.

If a dummy indicator for the second phase is significant in a multivariate analysis of the Two Plan counties, but an indicator for the first phase indicator is not, this suggests that the carve-out effect was concentrated in the default (mandatory) period when both plans were operational.

Model with continuous measure of the carve-out effect An alternate specification to the difference-in-differences , and to the use of one or more intercept shifts, is to use a continuous measure of managed care participation to capture the carve-out effect. A measure of percent participation in the managed care plans does characterize the gradual increase in participation, and the differences in rate of participation increase, that take place across the expansion counties. Modeling the carve-out policy change using the "uptake"—or participation in the new managed care systems as they are implemented—over time after the carve-out also recognizes that full participation in managed care was achieved in few counties during the study period. The rates of managed care participation among beneficiaries in the mandatory aid codes, as of January 1998, are illustrated by county in **Figure 4.3, Percent of Medi-Cal beneficiaries 0-21 years enrolled in managed care, January 1998—By mandatory group status and expansion county**. Specific reasons for conceptualizing the carve-out as having a continuous effect are provided in the paragraphs that follow.

Figure 4.3 – Percent of Medi-Cal beneficiaries 0-21 years enrolled in managed care, January 1998—By mandatory group status and expansion county
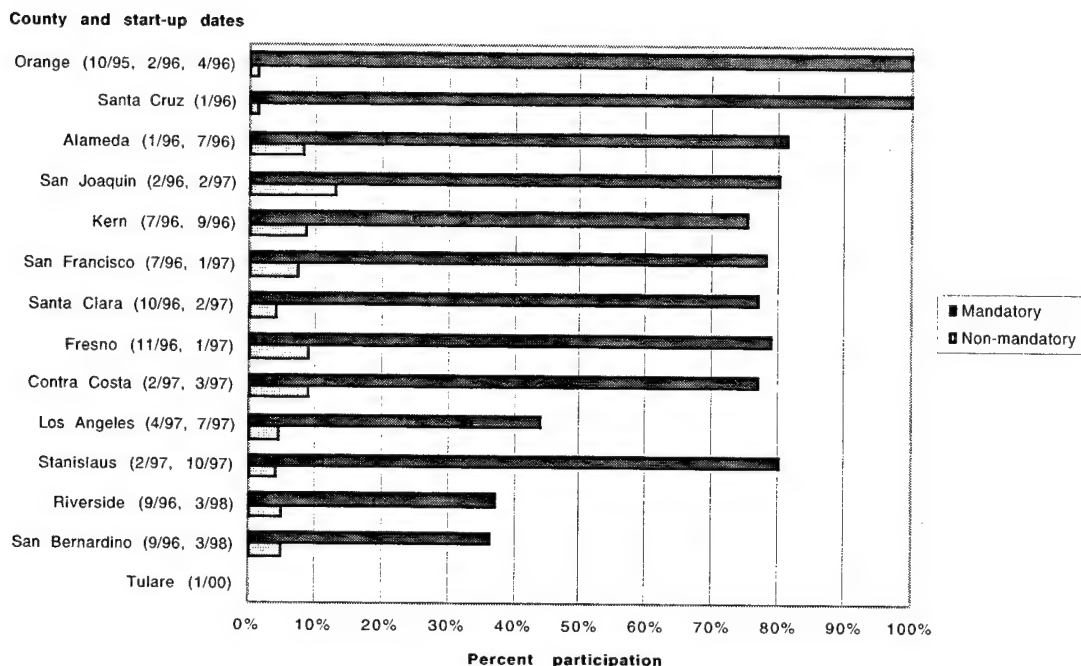
First, new Medi-Cal beneficiaries who are mandated to participate in managed care may not immediately enroll. This can occur because they have just become Medi-Cal eligible and have not yet selected a health plan. Statewide estimates of new Medi-Cal eligibles as a percentage of all Medi-Cal eligibles illustrate this point (1998 Managed Care Statistical Report). Between 1994 and 1996, approximately 2.5 percent of monthly Medi-Cal beneficiaries were new eligibles (mean monthly estimates were 2.5 percent in 1994 and 2.4 percent in 1996. Mean monthly estimates of new eligibles were slightly lower for Medi-Cal beneficiaries in the AFDC-related cash assistance group of aid categories, and ranged from 2.4 percent of all beneficiaries in 1994 to 2.0 percent in 1996.[45]

Second, the Two Plan expansion counties are still operating large FFS Medi-Cal systems because not all Medi-Cal beneficiaries are required to participate in managed care (MCSS 1999). Thus there is a service system in Two Plan counties that those who do not select a health plan can access

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[45] The methodology is as follows. MCSS calculated a denominator as all "eligibles" (the term used by MCSS to described enrollees) for the months of February, May, August, and November for each calendar year. Those who were eligibles for these months and who were ineligible in the previous 6 month period make up the population of "new" Medi-Cal enrollees for each of the months, and represent the numerator.

during the assignment process. (In contrast, almost all Medi-Cal beneficiaries in the COHS counties are in a mandatory participation group).

Third, some individuals receive retrospective Medi-Cal eligibility. As illustrated in **Figure 4.2**, a number of individuals become Medi-Cal eligible retrospectively (i.e., in one or more months following the index month). Examples of individuals who receive retrospective Medi-Cal eligibility could include individuals who submit Medi-Cal applications after incurring medical costs, newborns, and those with share-of-cost Medi-Cal. As **Figure 4.2** indicates, using eligibility based on data five months after an index month identifies a significant number of enrollees who were not identified as eligible in the index month. For the AFDC/cash grant aid categories, for example, the total eligible count increased by several percentage points between the index month and one or two months later. Retrospective months of Medi-Cal eligibility for an individual cannot be assigned to a prepaid health plan and instead are handled on a FFS basis. These months of eligibility are counted when managed care participation rates are calculated. Individuals who were conferred with eligibility retrospectively cannot be identified as such from the enrollment or claims data.

Fourth, the managed care implementation process in a county takes time. Los Angeles County has over one million Medi-Cal beneficiaries mandated to participate in managed care. The full Medi-Cal population in mandatory aid categories was not moved immediately into managed care arrangements. In the Two Plan model counties, the default process—in which beneficiaries who do not select a prepaid health plan are auto-assigned—begins only when all plans are operational. Until that time, beneficiaries can request the fee-for-service option when notified of the managed care requirement. Monthly rates of managed care participation during the transition period are provided in **Figure 4.4, Percent participation in post carve-out managed care in COHS and Two Plan counties, 1996-97—Mandatory managed care group**, and in **Figure 4.5, Percent participation in post carve-out managed care in Two Plan counties, 1996-97—Non-mandatory managed care group**.

Another reason for incomplete managed care participation among the mandatory group is due to the medical exemption option. Medi-Cal beneficiaries are permitted to request exemptions from mandatory participation if their primary care physician states that there is an ongoing treatment plan between the physician and the patient, and that the physician does not participate in Medi-Cal managed care. Children with CCS-eligible conditions are not specifically identified as a group for which exemptions are possible. They are likely to comprise a small proportion if any. An individual would require an existing relationship with a provider outside of health plan networks to qualify for the exemption. As participation in health plans increased, the number of individuals who would be able to meet this exemption criterion would likely drop. Also the carve-out preserves CCS eligible children's access to FFS through CCS, and thus the likelihood that being under the care of a non-network provider would affect their treatment plan would be relatively low. Figures provided by Medi-Cal indicate that the total number of beneficiaries who requested exemptions from the managed care requirement is actually relatively small during the study period. Total monthly exemptions granted for October 1997 through March 1998 are illustrated in **Table 4.3, Medical exemptions from mandatory managed care enrollment granted by SDHS, by Two Plan Model County—October 1997 through March 1998**, for the Two Plan Models that had

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fully implemented by that time. (Exemptions are not needed in counties with partial implementation because participation is not mandatory until full implementation is achieved).[46] Thus Medi-Cal enrollees in the mandatory managed care aid categories who have been granted exemptions by SDHS (as of the end of the study period) represent a very small proportion of beneficiaries in those aid categories.

A final reason for using percent MCP participation as the carve-out measure is to account for the "cross-over" effects. That is, not all mandatory eligibles participate in managed care. At the same time, some voluntary eligibles *do* participate in managed care. The substantial differences by county in participation rates at a point in time at the end of the study period were illustrated in **Figure 4.3**.[47] As discussed in this section, these differences are the result of contributing factors that include postponed mandatory enrollment/default; retrospectively conferred Medi-Cal eligibility; and extended transition periods in the larger counties.

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[46] The publicly available data are limited to total counts by county and month and are not stratified by eligibility aid code, by age, or by the specific reason for exemption.

[47] Additional reasons for incomplete managed care penetration have been identified from SDHS publications. These include the beneficiary having Medi-Cal in addition to commercial health insurance (Kaiser, or some prepaid health plan/HMO for example) that excludes them from enrolling in a Medi-Cal managed care plan, and the beneficiary living in an exempted zip code.

Table 4.3 – Medical exemptions from mandatory managed care enrollment granted by SDHS, by Two Plan county—October 1997 through March 1998

County	Total medical exemptions granted					
	Oct 1997	Nov 1997	Dec 1997	Jan 1998	Feb 1998	Mar 1998
Alameda						
Alameda Alliance	3	3	6	5	5	3
Blue Cross of California	4	6	4	1	1	2
Contra Costa [a]						
Contra Costa Health Plan	6	17	5	5	8	8
Health Net/Blue Cross	3	7	0	0	0	0
Fresno [b]						
Blue Cross of California	5	4	1	2	0	1
Health Net	1	1	1	1	0	0
Kern						
Kern Family Care	3	2	3	0	1	1
Blue Cross of California	0	1	0	0	0	1
Los Angeles						
L.A. Care	5	4	5	154	263	618
Health Net	1	4	7	20	18	79
Riverside	Enrollment not yet mandatory					
San Bernardino	Enrollment not yet mandatory					
San Francisco						
San Francisco Health Plan	1	5	2	6	1	1
Blue Cross of California	1	1	2	1	1	1
San Joaquin						
Health Plan of San Joaquin	4	5	1	1	4	1
Omni Health Care, Inc.	1	0	3	0	1	0
Santa Clara						
Santa Clara Family Health	2	1	3	2	4	0
Blue Cross of California	1	1	1	0	1	2
Stanislaus						
Blue Cross of California	0	7	5	2	3	0
Omni Health Care, Inc.	1	4	2	3	3	0
Tulare	Enrollment not yet mandatory					

[a] The CP in Contra Costa was switched from HealthNet to Blue Cross of California in 1998.
[b] No Local Initiative was developed in Fresno, and thus the county has two operating CPs.
Data from SDHS MMCD (from Maximus' MO2 Monthly Enrollment Summary Detail and M29 Medical Exemptions Summary reports)

Figure 4.4 – Percent participation in post carve-out managed care in COHS and Two Plan counties, 1996-97—Mandatory managed care group
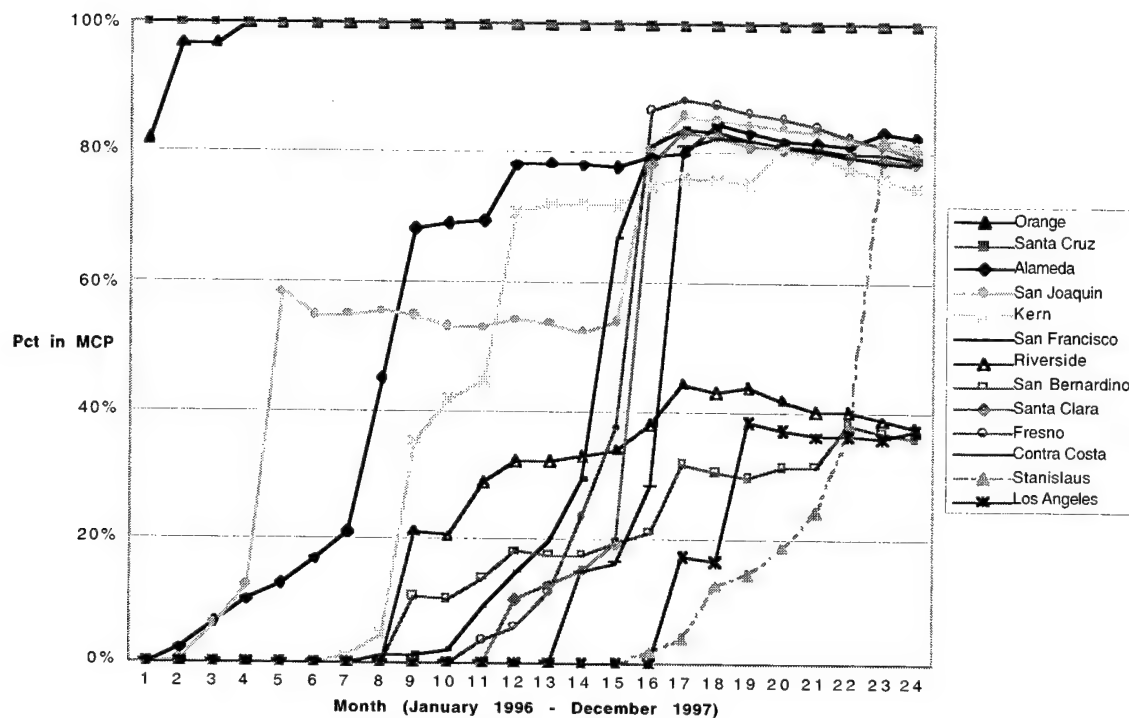
In summary, there are several reasons that not all beneficiaries in a mandatory group are actually directly subjected to the carve-out policy. At the same time, some beneficiaries in the voluntary group may actually enroll in managed care plans. The difference-in-differences models treat individuals as "exposed" to the carve-out effect if they are in the mandatory managed care participation group, in an expansion county. They are treated as unexposed if they are in a voluntary/exempt group. The DD models consider those in mandatory managed care aid categories as in an "intent to treat" group, given that managed care participation cannot be identified at the individual level from data available for this study. The measure of percent managed care participation does not extend this "intent-to-treat" to individuals.

The MCP participation variable that is used makes a different assumption. The specification of percent participation in managed care assumes linearity in the effect. It is possible that those who participated in managed care when the carve-out first took effect are different from later participants in ways that are related to likelihood of having a CCS eligible diagnosis. For this reason or other reasons stemming from physician and health plan awareness and referral practices, the assumption of linearity may not fit the carve-out experience exactly. Unfortunately, there is no way of

characterizing early participants relative to later participants without individual-level participation data. There is no specific evidence for an alternate, improved specification.

Figure 4.5 – Percent participation in post carve-out managed care in Two Plan counties, 1996-97—Non-mandatory managed care group
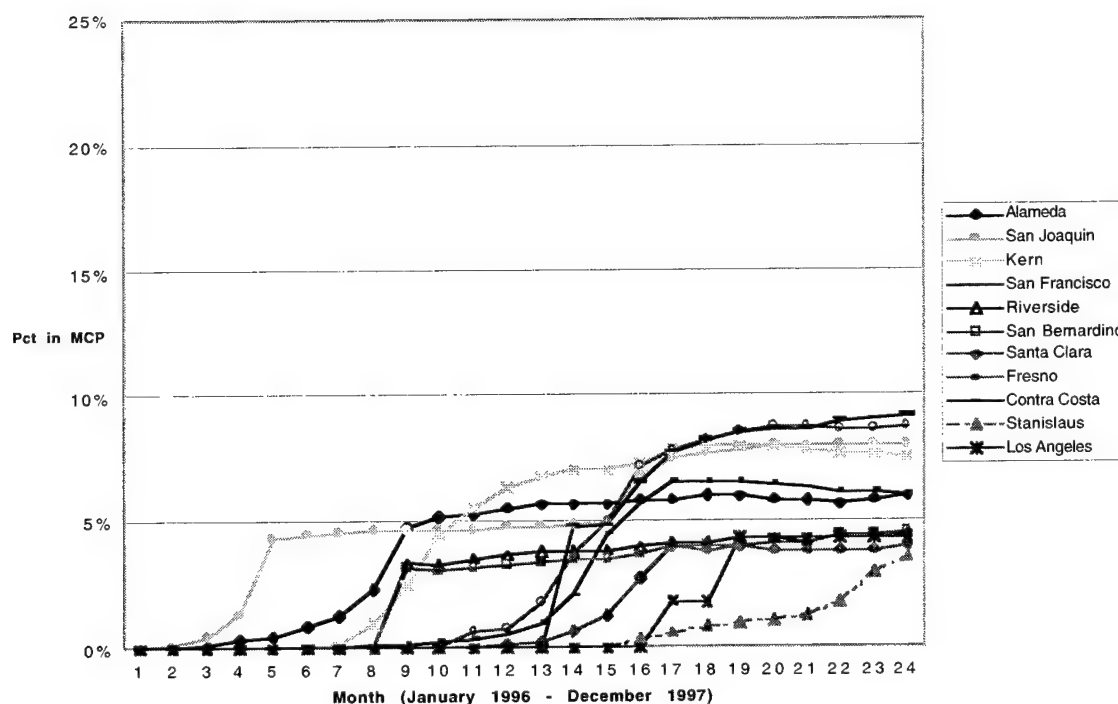
Multivariate Regression Models

Ordinary least squares (OLS) regression is used to define the impact of the carve-out on expenditures and program participation, controlling for the effects of Medi-Cal enrollment changes and other covariates. A log transformation was performed on dependent variables of expenditures and program participation, and on independent variables of managed care participation rates, for a more normal distribution of residuals. The logarithm of expenditures is particularly important because it is influenced less by a small number of large observations. The skewed distribution of expenditures for monthly claimants in Alameda County is illustrative. Mean monthly values in the mandatory group show an untransformed mean of $406 per claimant, with median per claimant expenditure of $272 and 95th percentile expenditure of $33,386. A set of pre-post specifications

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evaluate the changes separately for mandatory and non-mandatory groups, and separately for the individual expansion counties. A set of specifications that combines mandatory and non-mandatory groups is described below.

Difference-in-differences models In the difference-in-differences models, the regression approach provides for a model with interaction terms to estimate the effect of the carve-out. A similar model is elaborated in Gruber (1994). The unit of analysis is observations of the mandatory or voluntary managed care group, by county and time period.

The regression model is of the form:

$$(OUTCOME) = (\propto_1 Z) + (\propto_2 POST) + (\propto_3 AFFECT) + (\propto_4 POST*AFFECT)$$
$$+ (\propto_5 COUNTY) + (\propto_6 TIME)$$

where

OUTCOME	is the specific outcome (CCS claimants, CCS expenditures) for the county and eligibility group, for a specified time period (e.g., month)
Z	is a set of variables (e.g., total Medi-Cal enrollment, percent PHP participation) for the counties
POST	is equal to one for observations following the carve-out, and zero if otherwise
$\propto_3$	is a time invariant, fixed effect of membership in the affected (i.e., mandated) aid codes (AFFECT)
$\propto_4$	is the change in the affected (mandatory) aid codes relative to the non-mandatory aid codes in the post carve-out period
$\propto_5$	is the time invariant, fixed effect of the county
$\propto_6$	is the effect of time trend (e.g., year, season/quarter)

The rationale for and specifications of the independent variables are provided in the following sections. Fixed (time invariant) effects for the counties control for unknown, time invariant differences in characteristics that influence the outcome of interest. A dummy variable takes on a value of one for the post carve-out period and has value of zero in the pre-carve-out period. The effect of the carve-out is represented by the coefficient for the interaction term of post carve-out and affected group—whether it is significantly different from zero and whether its sign is positive or negative.

Continuous measure of carve-out effect models In the models that use percent participation in managed care to predict changes in the CCS outcome variables, the unit of analysis and covariates are similar to those in the difference-in-differences models. Log transformations of expenditures and program participation are used.

The specification builds on the regime shift variable so that the continuous MCP variable provides an effect estimate that is conditional on being in the post carve-out regime. Leaving linear (or transforming if necessary) the MCP variable, after adding the intercept shift, provides a better

representation of what took place by recognizing that the zero values are part of a different regime. This specification included an intercept shift in addition to the continuous MCP variable for each carve-out phase.

An optimal specification was sought for the continuous MCP variable, which has values of zero for all counties during the first two years of observations. The elasticities for this variable using log of claimant volume as the dependent variable, and either the untransformed percentage point variable or the log of MCP percentage plus one were comparable. However, adding other constants (e.g., 0.1, 0.01) produced different results, due to the large volume of zero values.

Residuals using linear and the log transformation generally did not suggest a particular transformation for either the mandatory or non-mandatory group results. OLS was used to compare R-square among specifications that used different power transformations of the MCP term (the particular specification used a regime change indicator), and using log dependent and log Medi-Cal enrollment. For the mandatory group, the linear MCP term produced the highest R-square although there was little change from lambda of 1 (semi-log) to lambda of 0 (which would have suggested log-log.

The regression model is of the form:

$$(OUTCOME) = (\propto_1 Z) + (\propto_2 POST) + (\propto_3 MCP) + (\propto_4 COUNTY) + (\propto_5 TIME)$$

where

OUTCOME	is the specific outcome (CCS claimants, CCS expenditures) for the county and eligibility group, for a specified time period (e.g., month)
Z	is a set of variables (e.g., total Medi-Cal enrollment, percent PHP participation) for the counties
POST	is equal to one for observations following the carve-out, and zero if otherwise
MCP	is the percent participation in managed care plans operating under the carve-out (by definition, equal to zero prior to the carve-out), plus one
$\propto_3$	is the percent change in the CCS outcome based on a one percent change in managed care participation
$\propto_4$	is the time invariant, fixed effect of the county
$\propto_5$	is the effect of time trend (e.g., year, season/quarter)

Measures of Key Variables

Outcome variables include CCS program participation, total participants within a diagnostic category, and CCS expenditures. A flexible function form was tested to find the best-fitting transformation of the dependent variable. Box-Cox transformation of the dependent variable of claimant volume generally produced lambda=0.15 and thus suggested a log transformation. Independent variables include Medi-Cal enrollment, managed care participation, and PHP

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participation. Specification of the independent covariates is described below along with measurement issues and limitations.

Medi-Cal enrollment trends   The multivariate models account for the changes to Medi-Cal enrollment over the study period, as well as the impact of any eligibility changes to the Medi-Cal program that take place. Changes in Medi-Cal enrollment signify a change to the base population from which children with CCS qualifying medical diagnoses are drawn. It would be misleading to attribute changes in CCS program participation to a policy change when in fact Medi-Cal enrollment—particularly for children—is dynamic. Population growth in California is one factor contributing to a different Medi-Cal population base. The study period of 1994 through 1997 also overlaps with significant flux in Medi-Cal enrollment for children, due to a combination of economic changes, eligibility expansions, and possibly anticipatory effects of welfare reform. A brief summary of these major trends follows.

Improved economic conditions over the study period constitute one exogenous change to Medi-Cal enrollment. **Appendix A.3** illustrates the trend toward fewer children in families living below the federal poverty level (FPL) in the early part of the study period, by county. Second, during the early 1990s, there was a de-linking of Medicaid from cash assistance recipient status that was expected to increase children's enrollment. It might be expected that gradual uptake of de-linked eligibility would increase the base population of potentially CCS eligible children. Finally, the Personal Responsibility and Work Opportunity Reconciliation Act of August 1996 tightened SSI eligibility criteria for children and also created time limits for families receiving AFDC cash assistance, or Temporary Assistance to Needy Families (TANF). Therefore, some loss of Medicaid eligibility could be observed towards the end of the study period.

Another figure shows annual trends in Medi-Cal enrollment for children. **Appendix A.4, Medi-Cal enrollment characteristics of California counties, 1994-1997**, presents Medi-Cal participation with subtotals by study status group. Specific characteristics include the percent of children 0-21 years enrolled in Medi-Cal, total child Medi-Cal enrollment, children 0-21 as a proportion of Medi-Cal enrollees in January of 1994 and 1997, and annual estimates of Medi-Cal enrollees as a proportion of the county population. For most counties, Medi-Cal enrollees increased as a proportion of the county population between 1994 and 1995 and then declined in 1996 and in 1997.

If TANF and economic trends affect children's enrollment in Medi-Cal, there may be aid category "switching" during the study period. For example, with TANF changes, children may move from the former AFDC-linked aid categories to non-cash poverty aid categories or to medically needy aid categories. Some but not all of such medically needy aid categories would confer share-of-cost requirements. Some of these transitions (e.g., to share-of-cost) also would move the child from a mandatory to a non-mandatory managed care status. This implies compositional changes within the

comparison groups.[48] A recently published analysis of Medi-Cal enrollment trends for children using data from the mid-study period (1995) illustrates the types of eligibility switches taking place (Ellwood & Lewis 1999). Comparison of these findings with California's managed care requirements for the Medi-Cal program reveals that most eligibility switches identified in the study are to aid categories *within* the same managed care status group.

It is possible that the total number of children with CCS qualifying medical diagnoses—whether identified/known to the CCS program or not—is relatively inelastic with respect to the enrollment changes observed for Medi-Cal beneficiaries (the base population). This is because those children who come onto the Medi-Cal rolls or drop from the rolls with slight economic changes similarly are less likely to have chronic conditions than those children who remain on the rolls. Children with CCS conditions may be less likely than other Medicaid beneficiaries to lose eligibility because their families and providers are likely to be motivated to sustain their eligibility whenever possible. However, total Medi-Cal enrollment is the best estimate available of the base population.

Participation in Medi-Cal managed care prior to the expansion   It is important to account for the rates of participation in prepaid health plans during the study period. This includes pre-expansion and transition periods in expansion counties, and the full study period for non-expansion counties.

In those counties with PCCMs and/or PHPs, the PCCMs generally were not at risk for specialty services—those that might be related to a CCS diagnosis as well as those related to other diagnoses.[49]

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[48] The Urban Institute study of Medi-Cal enrollment of children (using CY 1995 SMRF HCFA files) profiled the Medicaid enrollment outcomes of a cohort of 268,897 children (0 to 18 years) losing AFDC coverage from February through July 1995 (Ellwood & Lewis 1999). The following table illustrates the eligibility aid codes to which these children moved (if at all) and the mandatory managed care status (M denotes mandatory; NM denotes non-mandatory) applicable to these categories in expansion counties. For this period, the findings illustrate that most eligibility switches are to aid codes within the same managed care status group. If Two Plan Model county managed care criteria are used, this includes at least 90 percent of those who lost eligibility and were Medi-Cal eligible again in one month, and 72 percent of those who were eligible in six months.

Medicaid status	Month 1 (%)	Month 6 (%)	Two Plan managed care requirement	COHS managed care requirement
Medicaid enrollment group				
Transitional	7.7	5.3	M	M
Edwards vs. Kizer transitional	61.0	7.2	M	M
Poverty related	0.3	1.4	M	M
Medically needy	4.0	9.4	M/NM	M
Other non-cash	2.5	3.0	M/NM	M/NM
SSI	1.3	1.4	NM	M
AFDC cash	0.0	21.3	M	M
Not enrolled in Medicaid	23.1	51.0	---	---

Source: Adapted from Ellwood & Lewis, 1999

[49] PCCMs are capitated for a set or primary care services including outpatient physician services (capitated in all contracts) and—depending on the PCCM contract—obstetrics, pathology/laboratory, pharmacy, radiology, vision care, speech therapy, audiology, occupational therapy, and physical

Thus PCCM participation can be treated in the analyses as similar to the FFS option.[50] In contrast, as noted in an earlier chapter, PHPs in the pre carve-out period generally were at financial risk for all Medi-Cal services, including services related to a CCS qualifying medical diagnosis.

Pre carve-out PHP participation can affect the estimation of carve-out impact because the base population in the pre expansion/carve-out period in counties is not necessarily the same as the base population in the post carve-out period with such PHP contracts. The composition of the pre carve-out group in counties with these PHP contracts also is not necessarily comparable to the other counties.[51][52] Children who receive CCS-related services provided within the scope of the PHP contracts are not observed. To the extent that children with CCS qualifying medical diagnoses were enrolled in PHPs, Medi-Cal claims would only be observed for such children in these counties' post carve-out periods.[53] Enrollment in CCS-include prepaid health plans would have the effect of reducing the number of children and the volume and total costs of claims in the pre-carve-out period because the health plans were financially responsible for these services. There is reason to think that the magnitude of the carve-out effect would be associated with the percent participation in prepaid health plans before the carve-out. If children with CCS diagnoses were in these PHPs prior to the carve-out, then a carve-out effect estimated without consideration of the PHP participation would

therapy. Non-capitated services are on a FFS basis once authorized by the assigned case manager, with the exception of emergency services (HCFA 1993). The capitation is 95 percent of the FFS equivalent with any cost saving to the State on noncapitated services shared with the PCCM (SDHS Jan. 1993).

[50] It is possible to test for PCCM effects in a set of models, however, by distinguishing PCCM enrollment from FFS enrollment.

[51] Some counties with such PHPs had relatively low participation rates, and thus in those counties it is likely that only a small number of children with CCS eligibility were enrolled in these PHPs prior to the managed care expansion/carve-out implementation. For example, an Alameda County PHP (Kaiser) had a total enrollment in the month prior to the Alameda County implementation date of 1,559 Medi-Cal beneficiaries. This is fewer than one percent of Medi-Cal beneficiaries. Assuming that prevalence of children with CCS-eligible conditions in the PHP and fee-for-service populations is similar, approximately 24 CCS enrollees would be expected in the PHP (Kaiser's maximum Medi-Cal enrollment prior to 1996 was 2,600 enrollees, with a corresponding CCS enrollee estimate of 39).

[52] A number of studies show that individuals with chronic illness are less likely to enroll in and more likely to disenroll from PHPs than the general population (Hellinger 1995; Leibowitz, Buchanan, Mann 1992), in part because PHPs tend to restrict enrollees' choice of providers, and this makes PHP enrollment less attractive to those who need ongoing specialty care (Ellis & McGuire 1987; Eggers & Prihoda 1982; Berki & Ashcraft 1980). In a retrospective study of enrollment behavior, compared to children eligible for Medicaid through cash assistance (52.1 percent of whom enrolled in PHPs), children were less likely to enroll in PHPs if they were receiving SSI (24.1 percent enrolled, odds ratio 0.35) or received non-cash Medicaid eligibility (37.0 percent enrolled, odds ratio 0.66), and children eligible for Medicaid due to a disability were more likely than children with AFDC-linked Medicaid eligibility to disenroll (Scholle, Kelleher, Childs et al 1997). Similar results were reported from a study of AFDC/Medicaid eligible children in Baltimore (West, Stuart, Duggan et al 1996).

[53] This cohort of children cannot be identified from the claims data because they receive no FFS services. They cannot be identified from CCS caseload data because these children were not routinely referred to CCS by the prepaid health plans.

probably overestimate the true effect. Not accounting for this comparability problem could bias the results; the direction of this bias is hypothesized to be *towards* a carve-out effect.

Rates of PCCM and PHP participation are illustrated for children 0 to 21 years of age in Medi-Cal aid codes that became subject to mandatory managed care participation in the post carve-out period. **Table A.5, Participation of children 0-21 years in Medi-Cal managed care by county, 1994-1998 (mandated group)**, presents summary figures over the study period. These figures pertain only to children in mandatory managed care eligibility groups. This table presents participation rates within each county of enrollees in Medi-Cal managed care and in fee-for-service arrangements, by aid category in the pre and post-expansion periods. Specific characteristics include the percent of child Medi-Cal beneficiaries (enrollees) who are in managed care aid categories and are enrolled in managed care arrangements over the study period (1994-1997). The table shows that in approximately fifteen California managed care expansion counties, prior to the county's managed care expansion there were commercial PHPs in which CCS-eligible children could voluntarily enroll. The table indicates years during which managed care participation was voluntary as well as years in which managed care was mandatory for individuals in these aid categories. (Shaded areas indicate months of mandatory participation.)

Monthly trends in PHP participation for several managed care expansion counties also are illustrated in **Figure 4.6, Participation rates in "CCS-include" prepaid health plans of Medi-Cal beneficiaries in selected counties, 1996-1997**. Both **Table 4.4** and **Figure 4.6** show that PHP participation peaked at 10 percent of mandatory managed care group members in Riverside, nearly 20 percent in San Bernardino, nearly 25 percent in Riverside, and nearly 40 percent in Los Angeles County. **Figure 4.6** also illustrates PHP participation among the non-mandatory aid categories group in these counties. There was some participation that peaked at close to 5 percent across the counties.

Consequently it is important to account for PHP participation so that changes observed between the pre and post carve-out periods are related to the policy change rather than exclusively to children disenrolling from CCS-include prepaid health plans. It is possible to use the proportion of beneficiaries enrolled in PHPs to quantify the PHP participation effect. Data on monthly managed care participation provides prepaid health plan participation by aid category and county. However, participation is only available on an annual basis (months of January) for years 1994 and 1995. Thus the percent PHP participation for January must be used as a proxy for the percent PHP participation for all months in 1994 and in 1995.

Unfortunately, percent participation in PHPs of children with CCS medical diagnoses is unlikely to be well estimated by the percent participation of individuals within the same aid category who do not have CCS diagnoses. However, there are no data from which to ascertain prevalence of CCS eligibility within the PHPs. While anecdotal information from some child health advocates indicates that few children with CCS qualifying medical diagnoses voluntarily enrolled in these PHPs, or remained enrolled in a PHP once a CCS diagnosis was identified, there is no way of estimating prevalence of children with CCS-eligible medical diagnoses within these plans.

Figure 4.6 – Participation rates in "CCS-include" prepaid health plans of Medi-Cal beneficiaries in selected counties, 1996-1997
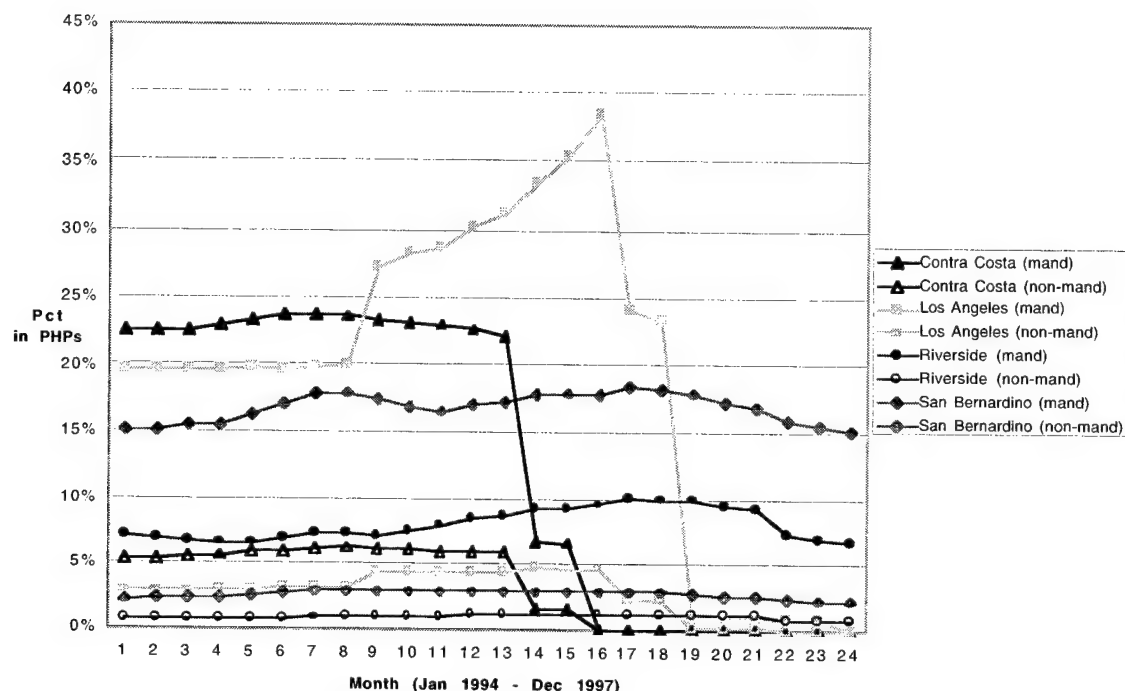
Model Specification

Serial correlation   The time series were evaluated for serial correlation of the residuals, using the Durbin-Watson statistic. Little evidence of serial correlation was found. For the specification of claimant volume predicted by continuous MCP participation in Two Plan counties, the Durbin-Watson statistic was 1.92 for the mandatory group model and 1.75 for the non-mandatory group model. For these specifications using total CCS expenditures as the outcome, the statistic was 2.04 for the mandatory group model and 2.03 for the non-mandatory group model. For two pre-post specifications for claimant volume using all Two Plan and non-expansion counties, the Durbin-Watson statistic was 1.98 for the mandatory group and 1.97 for the non-mandatory group.

Because the same counties are observed in the time series over a period of 48 months, the claimant volume and expenditure values may be correlated over time. This may cause standard errors to be

understated and thereby affect inferences of significance for the coefficients. In all regressions that pool counties, the assumption of independence within groups (the county cluster) is relaxed.

Heteroskedasticity A log transformation was used for the claimant volume measure and expenditure measure and for all of the independent variables with continuous values. The specifications with untransformed values of these variables indicated significant heteroskedasticity in the error terms. The White correction was used so that the standard errors would be consistent in the presence of heteroskedasticity.

County fixed effects Fixed effects control for differences across counties that are unknown and/or unobservable but are plausible. Examples of the types of differences in county health care systems that would be captured by fixed county effects include the following: underlying differences in CCS referral patterns across counties; differences in technology use; and medical care patterns that do not change (county to county) over the study period.

An important question with respect to the use of fixed county effects in the multivariate models is whether there are systematic differences in county CCS programs. Specific types of differences that would be relevant include differences in rates of identifying CCS eligible children among those who have CCS eligible conditions. Such differences may be attributable to characteristics of the local provider network that continue throughout the study period. An important type of difference occurs at the level of the local CCS program, as differences in interpretation of state eligibility criteria for medical diagnoses. While state eligibility criteria apply to all county programs, there may be small but potentially significant differences across counties in the specific criteria used to assess eligibility. This largely applies to diagnoses such as diabetes where medical judgment must be applied on a case-by-case basis to ascertain eligibility. There is anecdotal information reported by local providers to suggest that such differences occur (California Senate Office on Research, 2000). However, there is no specific information on the nature and scope of such differences or on whether any such differences are consistent in the counties over time.

Due to plausibility of such differences, county dummy variables were used in multivariate specifications that combine counties, to control for fixed differences across counties. For the claimant volume outcome, the county effects are jointly significant for the mandatory group and for the non-mandatory group. Thus fixed county effects were included in all specifications with more than one county.

Time effects There is a rationale for accounting for time trends by including time indicators in the multivariate analyses.[54] First, for epidemiological reasons there is a rationale for including season indicators; certain disease patterns may have a seasonal component. There may also be trends within the year that follow a seasonal pattern but are due to case processing procedures. The fact that a larger number of Medi-Cal eligibility redeterminations may occur in January, relative to other

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[54] For time trends that have equivalent effect for affected and unaffected eligibility groups, the trend could be differenced out in the multivariate difference-in-differences models.

months of the calendar year (personal communication, Jim Klein MCSS, 6/99), is another reason that seasonal trends may be observed in the claims data. It is important to consider such seasonal/quarterly effects in estimating the impact of the carve-out using a time series model. This is particularly important because carve-out implementation dates in some counties do overlap with specific seasons/quarters. Moreover, follow-up periods of less than a full year are available for some of the later implementing counties.

Second, it is important that the carve-out indicator variables not capture effects that are due to time trends rather than to the carve-out itself. Some statewide changes to CCS authorization policy over the study period have been identified. A report by Coopers & Lybrand (1997) identified an expansion in services that CCS authorizes (some changes in drug authorization and in outpatient and physician office visit authorization) effective after 1995.[55] Others will not be known and thus are best represented by a set of time trend dummy variables.

The advantage of including year indicators in the multivariate models is that these indicators will adjust for statewide trends/changes in the CCS program or potential beneficiary pool that are unrelated to the county changes occurring because of the carve-out. This will help to preclude inference of a carve-out effect when the effect is in fact one of time. However, there also are disadvantages to including year indicators in the models. If year dummies are specified and there are not true annual shifts, then these dummies can pick up some of post carve-out effect and thereby bias the estimates of carve-out effects by tending to underestimate the carve-out impact. It is possible to specify the model with and without year effects to evaluate sensitivity to their inclusion. Qualitative information provided by agency administrators may identify the timing of any significant policy changes that might have occurred during the time period.

A relevant question for the use of fixed effects is whether there are trends in the different counties that are unrelated to the policy change (i.e., the Medi-Cal managed care expansion and the CCS carve-out) but that vary systematically by county. If there is a clear rationale for expecting such effects, then these effects could be modeled by introducing county and time interaction terms into the multivariate models. Inclusion of these variables limits the degrees of freedom and makes it difficult to estimate the carve-out effect precisely.

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[55] Coopers & Lybrand evaluated trends in CCS authorized Medi-Cal claims to produce trended capitation rates for a proposed, fully capitated pilot project for Medi-Cal beneficiaries with CCS eligible diagnoses. Information sources for this consulting report were identified as "anecdotal information from program administrators regarding changes in responsibility for CCS covered services and incentives relating to identifying CCS eligible children"; changes in average cost per person; "changes in the state's budgeted cost per CCS child"; and "trend rates applied in the CCS program". The services "that in 1994 and 1995 did not require CCS authorization on the claim" were "physician office visits, laboratory and radiology services, and many prescription drugs" (Coopers & Lybrand 12/97, Data Book). The report states that some services that were Medi-Cal benefits in 1997 but not in 1994 and 1995 as historically a CCS responsibility include "augmentative alternative communication devices and EPSDT Supplemental Services, including in-home nursing and special care center services".

Finally, expenditures were not deflated to account for possible changes over time. Year and season effects were used to account for such changes.

Disaggregation by Medi-Cal Eligibility Aid Categories

Some analyses pool all aid categories based on their assignment to mandatory or to non-mandatory managed care participation. In fact, these pooled categories are heterogeneous. This is because by definition, the composition of beneficiary characteristics will vary across the Medi-Cal eligibility aid codes.[56] While there is likely to be variation by aid code within the managed care participation classification, the distribution of diagnoses and severity within the non-mandatory aid codes likely will not be equivalent to the distribution within the mandatory aid codes. The data permit an examination of the impact of the policy, as well as the impact of control variables (such as prepaid health plan participation and Medi-Cal enrollment trends) for the outcomes of interest by aid category.

A subset of Medi-Cal eligibility aid categories can be evaluated separately. Selection criteria included relatively large beneficiary volume; variation in terms of the reason for eligibility; and variation in the applicable Medi-Cal managed care requirements within and across counties. Selected aid categories include the following: aid category 60 (Medi-Cal eligibility linked to Supplemental Security Income (SSI)); aid category 34 (AFDC poverty level, no cash assistance); and aid category 30 (AFDC family cash assistance). Most other Medi-Cal eligibility aid categories are much smaller in size and thus are more difficult to analyze separately across counties.

Variation in Policy Effect Across Service Types

Variation across levels of service intensity   Incentives of the carve-out policy may have a greater effect on claims for outpatient care and ambulatory care than on claims for inpatient care.[57] The effect of the carve-out can be evaluated not only for total costs but also for costs within service type groupings. It is possible that increases in claimant volume are attributable to a higher frequency of claims submitted for diagnostic services, and/or a higher frequency of the CCS program authorizing such claims following the carve-out, relative to the pre carve-out period. An alternative hypothesis is that any changes that occur in claimant volume occur across all types of services. While it would be ideal to examine service types that represent specific hypotheses—such as diagnostic services—the complexity of Medi-Cal claims data makes this approach difficult. Thus trends were evaluated at the more aggregate levels of ambulatory physician services, hospital services, and pharmaceuticals.

Some caution must be exercised in interpreting such comparisons because possible care pattern trends—such as a substitution of outpatient for inpatient services, and expanded coverage of drug

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[56] There also will be systematic variation in the volume of beneficiaries by aid code.

[57] One hypothesis suggested by the literature on mental health carve-outs is that increased cost effects should be expected in high utilizers of services.

and office-based services by CCS—would contribute to observed changes and should not per se be captured by the carve-out effect.

Variation in Effects by Diagnosis and in Diagnostic Profile of Caseload

In terms of the volume of children referred to CCS, patterns by diagnosis may be observed in CCS program participation. Medical diagnoses for an individual child can be derived from the International Classification of Diseases (ICD) coding on claims for the child. The medical diagnosis that confers CCS eligibility will not necessarily correspond to the diagnosis information on a given claim. This is largely because CCS can authorize services for diagnoses that complicate a CCS diagnosis and also because in some cases the problem under treatment is not the underlying diagnosis. An example is a hospitalization for an infectious disease when the diagnosis conferring CCS eligibility is an immune disorder.

While it is possible to describe the diagnostic profile, an important question is how this profile is translated into meaningful information and to policy implications. There are data-driven limits to the profiling that is possible, due to typical issues in analyzing claims data. With respect to the investigation of changes in case-mix and even more so with respect to an overall profile of severity, changes in specific medical diagnoses will not always be directly correlated with a severity profile. An approach is to apply a general case-mix or severity adjustment scheme. The Medicaid claims files contain little direct information on the complexity and severity of the CCS condition. There are classification systems that produce a severity index using a combination of medical diagnosis and procedure information that is available in the claims data. These include the National Association of Children's Hospitals and Related Institutions (NACHRI) Pediatric Classification System for chronic childhood conditions (Gay, Muldoon, Neff et al 1998; NACHRI 1998, 1997; Muldoon 1997).[58] NACHRI's hierarchical severity ranking system has not been applied specifically to the Title V population, and thus its capacity to distinguish useful comparison groups (i.e., reasonably sized groups) for the CCS population is untested.

There are clear limitations to using a procedure-based classification system to infer program case-mix changes when the policy under study is expected to directly affect the volume and potentially types of procedures within the claims data. The coding of and the submission of procedures in claims potentially stem from a combination of varied and complex incentive structures, differences by provider, and other possible but unknown regional differences.

Approaches to classifying claimants by disease type

[58] This system was developed for use in financial risk adjustment in partnership with 3M and has undergone several years of validation testing. This classification system uses a combination of ICD-9 coding and procedure coding to generate a diagnostic severity ranking, a four-level severity ranking, and a major diagnostic coding (MDC) system that could be used in the regression model as an alternative to specific diagnostic information. The system uses procedure/service type coding to prevent the use of diagnostic coding when it comes from evaluative or diagnostic services or from laboratory or ambulance related services.

One way to characterize change in the diagnosis profile of the CCS caseload—or more specifically the diagnosis profile of services that CCS participants receive—is to evaluate change in the percent of CCS participants receiving services coded within different diagnosis groups. One measure counts a beneficiary once (and once only) as receiving services within the classification category if the beneficiary had at least one claim corresponding to that category in a given time period. The CCS eligibility categories are elaborated along with the corresponding ICD codes in the CCS Eligibility Manual (CCS Medical Eligibility, 1/15/79), which are outlined in **Table 3.1**. These categories correspond to ICD groups.

Use of claims data for diagnosis inference   It is important that claim coding changes unrelated to the policy effect of interest not affect the study outcome. However, there are challenges in using claim counts to infer carve-out response and impact with respect to CCS eligible diagnoses. This is because claim counts are affected by coding practice that in turn are influenced by unknown factors. Changes in "bundling" of services within claims or other claiming changes that are difficult to know about could explain some or all of any effects observed in total claim volume. Some of the variables constructed in this analysis to capture trends in diagnoses do use claim activity as a basis for the counts. The impact is somewhat buffered by use of all claims combined to identify diagnostic information. A set of claims within a particular diagnostic class and period of time (usually month) for an individual are counted only once in that category for the individual. To the extent that any unbundling effects cause more claims for an individual that are then attributed to different diagnosis categories, however, there will be an effect on the diagnosis counts. Only one diagnosis is associated with each claim, and thus unbundling raises the possibility of more diagnoses being identified.

It is possible that billing or coding changes occurred over the study period and that this would cause more (or fewer) diagnosis categories to be identified for a child, independent of any carve-out effect. Any such variations could in turn interact with coding changes, producing an artifact that could be mistaken as a carve-out effect. There are no specific hypotheses about how it might occur differentially across counties; occur concurrently with the carve-out; or affect mandatory and non-mandatory groups differently, based on differences in underlying diagnosis distribution or other factors.

Procedure and diagnosis based classification   Without using a classification system that is designed to estimate severity, it is not possible to characterize changes in "case-mix" of CCS participants with respect to severity. Using "counts" for inference treats the different diagnosis codes as "equal". On the other hand, use of a claims-based classification system for severity requires (by definition) a combination of diagnosis and procedure codes. By virtue of the carve-out policy, the severity profile produced by a combination of diagnosis and procedure data probably would change as a function of procedures billed to CCS. The artifact would be produced because more information is expected to be available on all procedures in the later years, relative to the early (pre-carve-out) years. If an artifact of billing changes, the resulting "case-mix" estimates would not reliably capture "case-mix" of CCS participants over time.

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Severity classification based on disease Applying the Disability Payment System (DPS) (Kronick, Dreyfus, Lee, Zhou 1996) to the diagnostic information would make it possible to further subcategorize where changes may be occurring. An advantage of using DPS is that within this system, whether or not a separate ICD-9 code is considered "unique" (and thus counted) depends (for a subset of categories) on a hierarchy that was developed with clinical input and with additional validation testing. It stratifies the distribution of children identified to CCS and receiving a CCS-authorized service based on severity within disease classifications. DPS also might pick up some of the diagnoses that fall into an "other" category when ICD-9 diagnosis categories are used; this could reduce the volume of diagnoses/services in that pool.

Another approach involves applying a simple severity ranking system that is developed specifically for a Title V population. The Michigan State Title V program developed a cost-driven severity ranking system for its managed care expansion that classifies common Title V program ICD-9 diagnostic codes into five categories, which are then further stratified by the child's age, to produce approximately 12 categories for payment adjustment. While the purpose of this severity ranking system is for financial risk adjustment, this is a very general ranking system that could be applied for the current study. It would be possible to construct a model with the dependent variable being the mean "case-mix" score as represented by the Michigan classification system. The highest category found for the beneficiary in a given month could be assigned to the beneficiary as a measure of "severity". As with other claimant models, in a regression framework the dependent variable would be the mean score with independent variables of volume of Medi-Cal enrollees (since overall case-mix in the population is conceivably affected by Medi-Cal enrollment trends), percent MCP participation, and fixed county and also year effects. A disadvantage of this approach is that the Michigan Title V classification system does not encompass all CCS eligible diagnoses. As an example, aggregating monthly beneficiary counts over the study period for Alameda County produced the following result. A total of 29.4 percent could not be assigned to a Michigan category; 5.7 percent were assigned to the lowest cost category; 10.2 percent and 26.7 percent, respectively, were assigned to the two intermediate cost categories; 8.6 percent were assigned to the highest cost category; and 19.3 percent were assigned to the cost category that includes all beneficiaries under 12 months of age, irrespective of diagnosis. (As constructed, the counts in this example permitted a beneficiary to appear in multiple diagnosis categories in a given month). The relatively large proportion of claimants who could not be classified in a given month suggests that this classification system does not fit the CCS population well and makes it difficult to interpret any compositional changes that might appear to occur using these classifications.

4.3   Design and Methods for Contextual Analysis of the Carve-out Policy

To strengthen this study as a policy analysis, a protocol was developed for qualitative interviews with county CCS administrative staff in several of the counties implementing the managed care expansion and CCS carve-out. The objective was to gain a more detailed, contextual understanding of CCS carve-out implementation in these counties. Although CCS county agencies operate under identical state program rules for eligibility and authorization, there may be slight operational

differences within or between carve-out counties. Thus a second objective was to investigate underlying differences across counties that could lead to different caseload and expenditure outcomes.

4.3.1   Interview Protocol

In-person or telephone interviews were conducted with medical directors, medical consultants, program administrators, and/or CCS nurses who perform a liaison function with the local managed care plans, in Alameda, Contra Costa, Kern, Los Angeles, and Orange counties. The unstructured interview protocol used a common set of questions for each study participant. Results from the quantitative analysis in this study were not used as a basis of the interview or presented to the participants before or during the interviews.

The general domains covered in the qualitative interviews, and specific areas within these domains, are summarized in **Table 4.4, Domains in CCS agency interview protocol**. The interviews covered the following areas: (1) characteristics of the carve-out policy implementation in the county, and observed pre and post carve-out differences in referral patterns; (2) perceptions about factors that could contribute to "cost-shifting" practices and enhanced referral of potentially eligible children to CCS, including responses by providers and health plans; (3) the organizational impact of the carve-out policy on CCS (e.g., resolution procedures for CCS/health plan disputes about responsibility for specific services; new relationships between the CCS program and local health plans); and (4) any health system changes and programmatic factors that may be affecting CCS case finding and costs for child Medicaid beneficiaries, but that are unrelated to the carve-out policy.

Results from the interviews were summarized by topic area and are presented in Chapter 7. Qualitative findings were integrated with results from quantitative analyses in the concluding chapter. The findings were generally not incorporated into the discussion of the quantitative findings in Chapter 6, nor used in the quantitative analyses for modeling or other purposes. Instead the findings were used to interpret some of the quantitative findings, to provide insight into the local responses to the carve-out incentives, and to identify some of the effects of the carve-out on the CCS program that the quantitative analyses do not address.

Table 4.4 – Domains in CCS agency interview protocol

Domains and Specific Areas

Features of carve-out implementation across counties
 	
    Awareness of the CCS program and eligibility
        (a) Changes in awareness by prepaid health plans
        (b) Changes in awareness by providers
    Pre-post carve-out referrals to CCS
        –   Timing of any observed referral change

Response of plans/providers to the carve-out
 	
    Changes in referral
        –   Changes in referral types
        –   Likelihood of a referral identified as CCS-eligible
    Differences between local and commercial plans
    Changes in CCS paneling among providers
    Family responses to managed care requirement

Significant programmatic and authorization policy changes to CCS/Medi-Cal during study period
 	
    County history of "circumvention" of CCS authorization
    Dispute issues and resolution

Organizational impact of carve-out policy for CCS
 	
    Changes to CCS program or capacity
    Reporting and data analysis
    Other carve-out issues or impact

CHAPTER 5—IMPACT OF CARVE-OUT POLICY ON TITLE V CASE-FINDING

This chapter reports findings for the carve-out impact on CCS program participation. The chapter begins with a description of mean monthly CCS claimant volume across California counties over the course of the study period. This is followed by results from the multivariate analyses using the following: (1) pre-post comparisons, including the difference-in-differences approach comparing change in mandatory and non-mandatory groups, and (2) the continuous MCP participation approach. Some specifications pool aid categories statewide by mandatory managed care requirement status. Other specifications examine the carve-out impact in each expansion county. Results are first presented for the Two Plan counties, followed by a summary of the findings for the COHS expansion counties. The carve-out effect is then evaluated for several Medi-Cal aid categories. This is followed by an analysis of how the diagnostic profile of children receiving CCS services changes with the carve-out, for counties overall and individually. The chapter concludes by integrating results from these analyses.

5.1 Descriptive Trends in CCS Claimant Volume

This section describes trends in CCS program participation across California counties during the study period. While the timing and the rate of managed care implementation were different for each expansion county, an illustration of time trends in the outcome variables is useful.

Total Claimants, and as a Percent of Medi-Cal Beneficiaries

Study period trends in CCS claimants are provided in **Table 5.1, Mean monthly CCS claimant volume in California counties, annually for 1994-1997.**[59] This table stratifies CCS claimants by their Medi-Cal managed care requirement status (i.e., eligibility aid categories that require managed care participation in managed care expansion counties, and eligibility aid categories that do not).[60] The table shows results of overall tests of the equality of annual means $(F(3,44))$. Mean monthly CCS claimant volume varied by year in nearly every expansion county. The exception was San Bernardino where equality of the annual means could not be rejected (p=0.11). Total claimants generally increased within the mandatory group for each of the 22 counties that had any managed care over the course of the study period. Exceptions among the 14 expansion counties included Los Angeles, San Bernardino, and Santa Clara.

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[59] These figures use CCS claimant counts that can be lagged by many months for the numerator (up to 10 months for the December 1997 counts, and up to 58 months for the January 1994 counts), and six months lagged Medi-Cal enrollment counts for the denominator.

[60] In this table, managed care participation requirements in the *Two Plan* counties are used to define mandatory group status. Thus totals shown here for COHS counties do not reflect the actual mandatory and non-mandatory division that operated in COHS counties. Because nearly all Medi-Cal beneficiaries participated in managed care after COHS start-up, both groups designated in this table (mandatory and non-mandatory) were subject to mandatory MCP participation.

Table 5.1 – Mean monthly CCS claimant volume in California counties, annually 1994—1997

Model	County	Non-mandatory [a]					Mandatory [a]				
		1994	1995	1996	1997	p value	1994	1995	1996	1997	p value
MC expansion counties—Early implementing counties (4)											
2-plan	Alameda	283	347	379	460	.00	190	201	225	272	.00
2-plan	Kern	149	158	183	253	.00	91	104	139	218	.00
COHS	Orange [b]	657	599	853	939	.00	329	284	462	503	.00
COHS	Santa Cruz [b]	76	100	129	138	.00	49	54	83	95	.00
Other MC expansion counties (10)											
2-plan	Contra Costa	142	170	180	184	.00	57	78	71	106	.00
2-plan	Fresno	321	289	306	435	.00	137	121	130	281	.00
2-plan	Los Angeles	3,391	3,671	4,002	4,173	.00	2,225	2,191	2,124	1,893	.00
2-plan	Riverside	304	413	454	483	.00	179	182	181	200	.01
2-plan	San Bernardino	477	600	735	832	.00	343	320	317	333	.11
2-plan	San Francisco	176	180	197	244	.00	90	89	78	106	.00
2-plan	San Joaquin	173	214	230	273	.00	86	103	116	143	.00
2-plan	Santa Clara	285	341	351	318	.00	177	206	186	179	.00
2-plan	Stanislaus	123	198	200	206	.00	61	170	77	84	.00
2-plan	Tulare	137	145	153	176	.00	75	79	77	90	.00
Other MC expansion counties—Unique MC models (3)											
MCN	Placer	18	29	38	36	.00	11	17	20	16	.00
GMC	San Diego	532	763	812	898	.00	294	324	302	399	.00
MCN	Sonoma	78	108	123	133	.00	43	45	44	44	.00
Other MC expansion counties—Not implementing CCS carve-out (5)											
COHS	Napa	23	32	41	49	.00	8	11	12	11	.00
GMC	Sacramento	305	402	487	535	.00	222	275	322	334	.00
COHS	San Mateo	109	155	147	164	.00	77	91	99	111	.00
COHS	Santa Barbara	81	106	140	172	.00	82	82	94	92	.00
COHS	Solano	16	2	6	99	.00	11	0	3	47	.00
Non-MC expansion counties—With voluntary MC (3)											
----	Madera	24	26	26	35	.00	16	17	18	20	.00
----	Marin	27	33	36	36	.00	14	15	17	20	.00
----	Yolo	24	35	36	47	.00	20	15	18	27	.00
Non-MC expansion counties (33)											
----	Alpine	0	0	0	1	.00	0	0	0	0	.41
----	Amador	3	2	4	5	.00	1	2	2	3	.09
----	Butte	70	72	88	119	.00	24	28	29	36	.00
----	Calaveras	6	7	7	8	.06	4	4	3	4	.25
----	Colusa	4	4	8	5	.00	2	3	3	4	.03
----	Del Norte	5	5	6	6	.67	3	2	3	3	.36
----	El Dorado	12	15	24	30	.00	8	6	11	18	.00
----	Glenn	8	9	15	16	.00	5	4	5	7	.11
----	Humboldt	37	31	35	44	.00	20	19	21	20	.76
----	Imperial	36	39	44	53	.00	29	29	29	31	.41
----	Inyo	1	1	3	3	.00	3	1	2	2	.14

Model	County	Non-mandatory [a]					Mandatory [a]				
		1994	1995	1996	1997	p value	1994	1995	1996	1997	p value
----	Kings	17	21	17	20	.06	10	14	15	17	.00
----	Lake	12	15	17	21	.00	10	14	9	15	.00
----	Lassen	4	3	4	5	.00	3	1	2	4	.04
----	Mariposa	1	1	1	1	.30	1	1	1	1	.77
----	Mendocino	28	31	29	37	.00	15	19	18	22	.02
----	Merced	66	87	108	125	.00	35	51	54	59	.00
----	Modoc	0	1	2	2	.00	1	0	1	1	.00
----	Mono	1	2	1	1	.02	1	1	1	0	.19
----	Monterey	89	120	135	127	.00	72	84	69	67	.01
----	Nevada	14	13	15	22	.00	7	6	9	9	.00
----	Plumas	1	1	2	3	.00	1	1	2	3	.00
----	San Benito	10	9	17	16	.00	8	8	8	7	.69
----	San LuisObispo	60	85	95	102	.00	32	34	36	33	.35
----	Shasta	35	55	63	74	.00	14	20	27	27	.00
----	Sierra	1	1	1	0	.49	0	0	0	1	.05
----	Siskiyou	8	7	8	11	.01	2	4	6	7	.00
----	Sutter	13	12	19	24	.00	12	8	11	15	.00
----	Tehama	8	11	15	17	.00	9	9	8	10	.76
----	Trinity	2	4	5	6	.00	1	1	1	1	.24
----	Tuolomne	9	13	12	10	.03	8	5	4	6	.00
----	Ventura	142	198	222	234	.00	55	65	61	58	.03
----	Yuba	16	12	17	21	.00	13	9	14	14	.00

[a] Mandatory managed care group status uses definition in place for Two Plan counties.
[b] Using COHS county definition of mandatory group, annual monthly means are as follows for the two COHS expansion counties. For Orange, non-mandatory means were 267 (1994), 131 (1995), 176 (1996), 196 (1997), p=0.00 (F(3,44)) and mandatory means were 720 (1994), 751 (1995), 1,139 (1996), 1,246 (1997), p=0.00 (F(3,44)). For Santa Cruz, non-mandatory means were 16 (1994), 16 (1995), 17 (1996), 18 (1997), p=0.00 (F(3,44)) and mandatory means were 108 (1994), 138 (1995), 195 (1996), 214 (1997), p=0.00 (F(3,44)).

The question of whether mean monthly totals were higher in the expansion year(s) was evaluated for each expansion county. Year by year differences were evaluated using Scheffe-adjusted significance levels. While implementation dates varied by county, most were fully implemented by early 1997. Thus monthly totals were expected to be higher in 1997 than in earlier years. For the mandatory group, mean claimant volume was *not* higher in 1997 relative to earlier years for Santa Clara, Stanislaus, and Los Angeles counties for the mandatory group. Tests of equality of means (t(1,21)) showed that in Los Angeles, total claimant volume for the mandatory group was lower in 1997 compared to 1994 (p<0.001), to 1995 (p<0.01), and to 1996 (p<0.05) (with Scheffe adjustment). Claimant volume in the mandatory group was higher in 1995 compared to each other year for Santa Clara County and for Stanislaus County, which did not have a higher mean in 1997 relative to earlier years. Mean monthly claimant volume for the expansion and comparison groups across the study period is illustrated in **Figure 5.1**, **Mean CCS claimant volume in Two Plan (excludes L.A.) and in non-expansion county groups—1994-97, Mandatory managed care group** and in **Figure 5.2**, **Mean CCS claimant volume in Two Plan (excludes L.A.) and in non-expansion county groups—1994-97, Non-mandatory managed care group**.

Figure 5.1 – Percent participation in post carve-out managed care in COHS and Two Plan counties, 1996-97—Mandatory managed care group
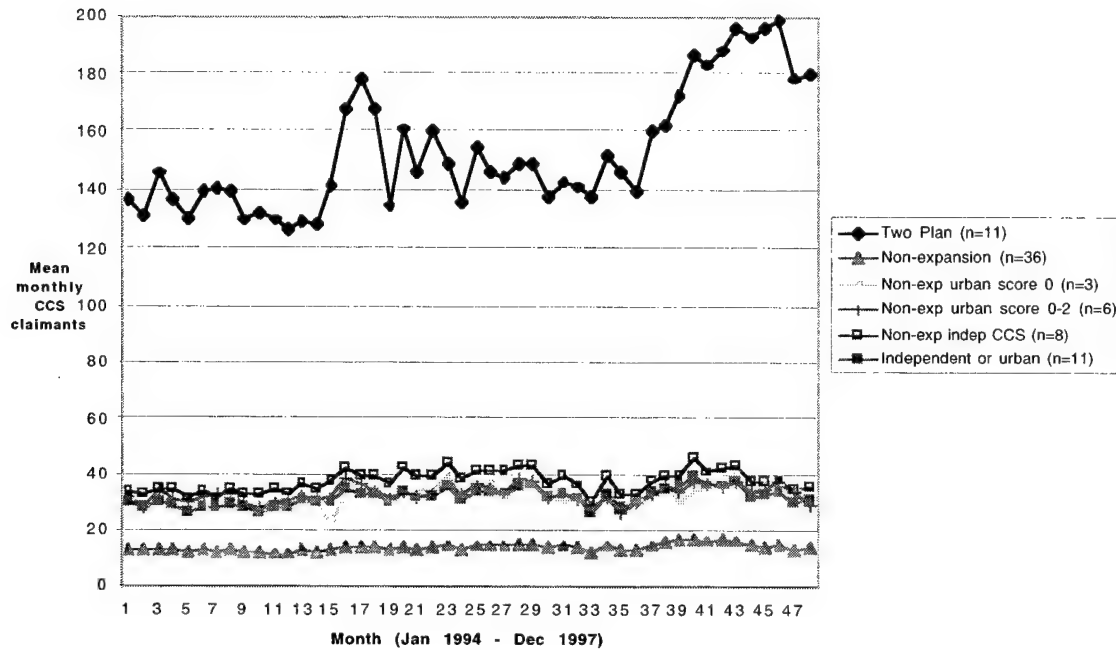
The time trends found for the mandatory group—specifically higher claimant volume in 1997 relative to each of the preceding years—did not hold across all expansion counties for the non-mandatory group. Counties in which CCS claimant volume did not increase between 1996 and 1997 included Los Angeles, Riverside, Santa Clara (where mean monthly claimant volume fell), and Stanislaus. An increase between 1996 and 1997 also was not found for the two COHS counties that implemented in late 1995 or early 1996 (Orange and Santa Cruz). In summary, mean monthly volume in 1997 was higher than in 1994 and/or 1995 for both mandatory and non-mandatory groups in nine (9) counties; in mandatory groups only in one (1) county; in non-mandatory groups only in two (2) counties; and in neither group for two (2) counties. This suggests that any claimant volume increases were not unique to the mandated group.

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Figure 5.2 – Percent participation in post carve-out managed care in COHS and Two Plan counties, 1996-97—Non-mandatory managed care group
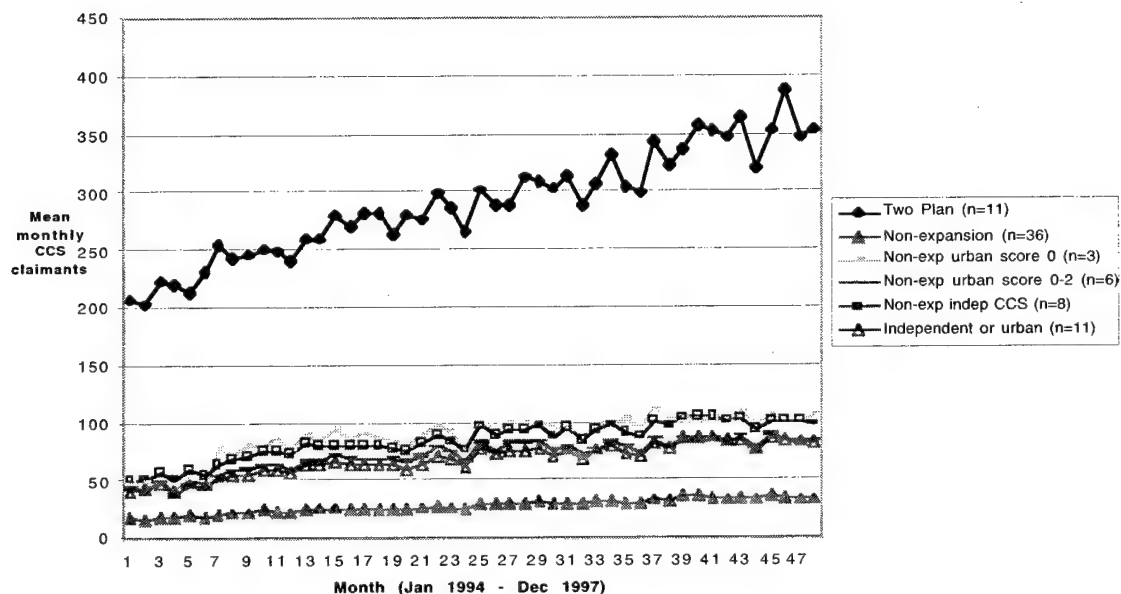
An example illustrates trends in claimant volume and a key predictor variable for a particular expansion county. A plot of claimant volume with values of key predictor variables over the study period is provided for Alameda County. These are illustrated in **Figure 5.3, Total children with CCS-authorized claim and percent MCP participation, Alameda County—By Medi-Cal managed care group status**. The figure shows total CCS claimants, pre carve-out PHP participation, and post carve-out MCP participation between 1994 and 1997. The start-up date for each plan in Alameda County (the Local Initiative and the Commercial Plan) also is indicated. Values of each variable are provided for mandatory and for non-mandatory managed care groups.

Figure 5.3 – Total children with CCS-authorized claim and percent MCP participation, Alameda County—By Medi-Cal managed care group status
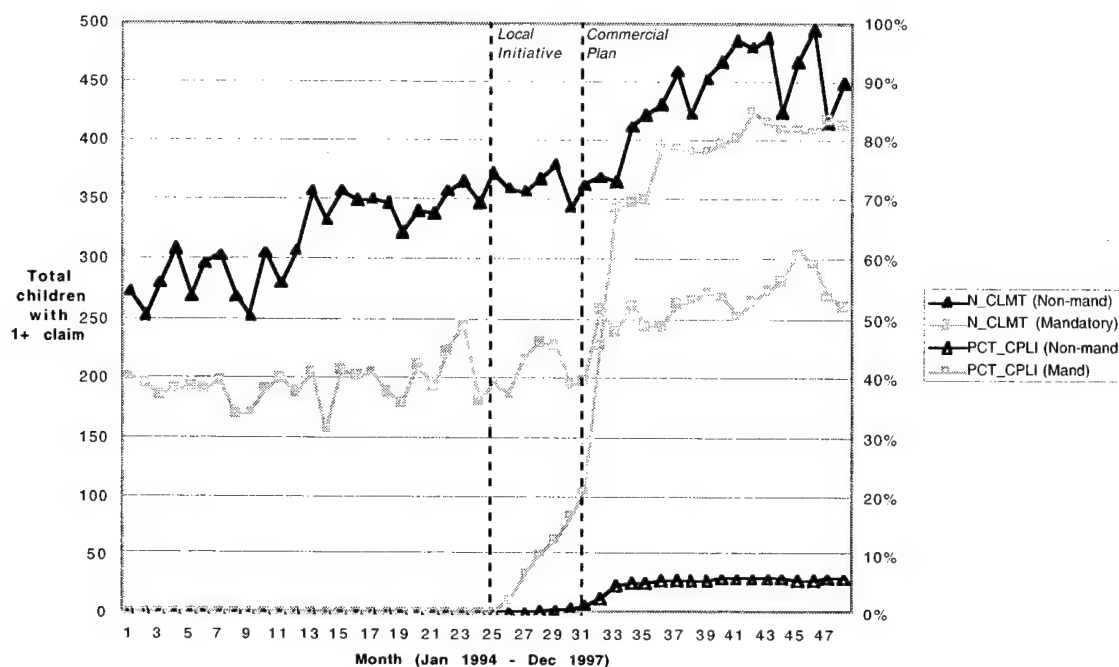
In preparation for evaluating monthly prevalence trends for CCS claimants within the Medi-Cal population, Medi-Cal enrollment was examined by year. **Table 5.2, Mean monthly Medi-Cal enrollment in California counties, annually for 1994-1997,** illustrates how the base population of Medi-Cal enrollment changed over the course of the study period. Medi-Cal enrollment generally declined in the mandatory group by year. In contrast, monthly Medi-Cal enrollment in the non-mandatory group was steady or increased by year in most expansion and non-expansion counties.

Table 5.3, Mean monthly CCS claimants as a proportion of Medi-Cal beneficiaries in California counties, annually for 1994-1997, uses total Medi-Cal enrollment (all non-aged beneficiaries) as the base population. This figure also stratifies participation trends by mandatory managed care group. Results show that the mean monthly volume of CCS claimants as a proportion of Medi-Cal beneficiaries differed by year in the sizable expansion and non-expansion counties. The general trend for the mandatory group as well as in the non-mandatory group was an increasing time trend in the 14 expansion counties. In several expansion counties—including Alameda, Kern, Orange, Santa Cruz, Contra Costa, and Fresno—CCS claimants as a percent of Medi-Cal enrollees nearly doubled. In most expansion counties, the annual mean of monthly claimants as a percent of Medi-Cal

Table 5.2 – Mean monthly Medi-Cal enrollment in California counties, annually 1994—1997

County	Non-mandatory [a]					Mandatory [a]				
	1994	1995	1996	1997	p value	1994	1995	1996	1997	p value
MC expansion counties—Early implementing counties (4)										
Alameda	52,262	54,484	56,190	56,061	.00	131,438	130,623	125,496	114,002	.00
Kern	32,262	34,968	37,771	37,613	.00	92,660	99,175	104,262	99,842	.00
Orange [b]	81,589	83,812	83,157	79,379	.00	181,180	180,961	173,414	154,476	.00
Santa Cruz [b]	8,181	8,737	8,713	8,552	.00	17,199	17,724	16,816	15,255	.00
Other MC expansion counties (10),										
Contra Costa	24,893	26,031	26,914	26,988	.00	59,285	59,437	58,250	54,044	.00
Fresno	48,717	50,628	52,175	51,372	.00	153,524	153,379	150,621	140,372	.00
Los Angeles	469,686	475,185	494,354	484,355	.00	1,221,438	1,203,585	1,165,918	1,105,653	.00
Riverside	45,388	48,755	51,729	52,322	.00	145,397	149,853	150,839	139,630	.00
San Bernardino	58,293	60,284	63,105	64,223	.00	242,602	241,354	237,134	219,261	.00
San Francisco	41,969	42,869	43,208	42,481	.00	53,900	51,530	48,091	42,889	.00
San Joaquin	28,657	29,678	30,718	30,767	.00	86,219	85,932	86,925	82,499	.00
Santa Clara	49,311	50,429	51,247	49,420	.00	120,854	118,276	108,553	93,148	.00
Stanislaus	21,964	23,245	24,117	23,908	.00	64,197	65,305	64,903	61,612	.00
Tulare	25,175	25,762	26,507	26,119	.00	72,490	72,413	72,581	68,654	.00
Other MC expansion counties—Unique MC models (3)										
Placer	4,834	5,008	5,330	5,307	.00	11,774	11,571	11,001	10,016	.00
San Diego	83,704	86,085	87,760	85,768	.00	241,538	241,343	233,794	210,686	.00
Sonoma	13,536	13,920	14,186	14,063	.00	24,900	25,367	24,153	21,686	.00
Other MC expansion counties—Not implementing CCS carve-out (5)										
Napa	3,663	3,845	4,008	3,911	.00	6,457	6,430	6,161	5,627	.00
Sacramento	49,834	52,907	55,753	56,925	.00	167,621	170,506	169,895	164,592	.00
San Mateo	18,119	18,658	19,209	18,955	.00	27,267	27,756	25,727	21,977	.00
Santa Barbara	15,064	15,540	16,122	15,724	.00	30,404	30,310	29,735	27,347	.00
Solano	10,009	10,238	10,751	10,964	.00	30,160	31,405	31,891	31,100	.00
Non-MC expansion counties—With voluntary MC (3)										
Madera	7,231	7,449	7,965	7,983	.00	16,650	17,752	18,745	18,068	.00
Marin	5,109	5,223	5,482	5,455	.00	6,528	6,473	6,319	5,880	.00
Yolo	5,608	5,936	6,269	6,430	.00	16,516	16,495	16,430	15,802	.00
Non-MC expansion counties—With voluntary MC (3)										
Alpine	44	50	49	48	.03	147	154	176	173	.00
Amador	496	526	598	606	.00	1,674	1,752	1,680	1,647	.00
Butte	9,310	10,163	10,741	11,183	.00	29,258	29,220	29,491	28,381	.00
Calaveras	934	1,062	1,111	1,195	.00	3,434	3,612	3,566	3,640	.00
Colusa	998	1,040	1,183	1,165	.00	2,182	2,390	2,284	2,101	.02
Del Norte	1,704	1,807	1,873	1,834	.00	4,313	4,458	4,507	4,525	.00
El Dorado	3,265	3,399	3,659	3,670	.00	8,478	8,621	8,438	7,456	.00
Glenn	1,369	1,415	1,574	1,612	.00	3,986	3,921	3,703	3,468	.00
Humboldt	6,687	6,855	7,045	7,012	.00	15,841	15,661	15,304	14,901	.00
Imperial	6,967	7,145	7,263	7,442	.00	28,064	28,188	28,292	27,106	.00
Inyo	674	715	748	745	.00	1,864	1,808	1,790	1,848	.00
Kings	6,058	6,132	6,512	6,212	.00	16,599	17,001	17,387	16,508	.00
Lake	3,182	3,260	3,469	3,502	.00	9,145	9,253	9,045	8,524	.00
Lassen	1,152	1,176	1,217	1,204	.00	3,508	3,577	3,477	3,317	.00
Mariposa	373	384	393	394	.00	1,651	1,667	1,649	1,678	.20

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County	Non-mandatory [a]					Mandatory [a]				
	1994	1995	1996	1997	p value	1994	1995	1996	1997	p value
Mendocino	4,420	4,756	5,201	5,197	.00	10,673	11,276	11,206	10,634	.00
Merced	13,306	13,982	14,564	14,270	.00	45,482	47,146	46,556	42,827	.00
Modoc	558	579	594	605	.00	1,617	1,687	1,719	1,560	.00
Mono	227	230	241	239	.01	516	491	513	519	.01
Monterey	14,821	15,275	15,725	15,443	.00	36,064	36,971	35,875	33,098	.00
Nevada	1,800	1,919	2,052	2,147	.00	4,966	5,131	4,888	4,361	.00
Plumas	707	734	788	782	.00	2,022	2,138	2,010	1,722	.00
San Benito	1,218	1,298	1,397	1,443	.00	4,158	4,009	4,108	3,820	.00
San Luis Obispo	6,931	7,182	7,560	7,700	.00	13,664	14,289	14,310	13,265	.00
Shasta	8,061	8,596	9,073	9,324	.00	21,991	22,488	24,131	23,252	.00
Sierra	110	100	130	121	.00	222	210	225	206	.05
Siskiyou	2,395	2,536	2,636	2,636	.00	6,503	6,414	6,327	5,935	.00
Sutter	3,437	3,623	3,713	3,774	.00	9,000	9,064	8,642	8,484	.00
Tehama	2,891	2,972	3,102	3,143	.00	7,947	7,976	7,930	7,326	.00
Trinity	622	658	686	728	.00	1,715	1,646	1,701	1,572	.00
Tuolomne	1,429	1,555	1,663	1,642	.00	4,591	4,776	4,743	4,545	.00
Ventura	20,260	21,684	22,871	22,374	.00	47,569	47,642	46,892	43,192	.00
Yuba	3,983	4,149	4,388	4,431	.00	13,656	14,146	14,227	12,867	.00

[a] Mandatory managed care group status uses definition in place for Two Plan counties.
[b] Using COHS county definition of mandatory group, annual monthly means are as follows for the two COHS expansion counties. For Orange, non-mandatory means were 43,574 (1994), 43,585 (1995), 42,340 (1996), 38,315 (1997), p=0.00 (F(3,44)) and mandatory means were 219,195 (1994), 221,187 (1995), 214,231 (1996), 195,540 (1997), p=0.00 (F(3,44)). For Santa Cruz, non-mandatory means were 2,910 (1994), 3,152 (1995), 3,072 (1996), 2,958 (1997), p=0.00 (F(3,44)) and mandatory means were 22,469 (1994), 23,309 (1995), 22,456 (1996), 20,849 (1997), p=0.00 (F(3,44)).
p value for test of equality of means F(3,44)

enrollees in 1997 was significantly higher than the annual means for 1994, for 1995, and for 1996. The exceptions were Los Angeles County (with no differences between any of the annual means) and San Bernardino County (where the 1997 annual monthly mean was statistically different from 1994 only). One inconsistent trend was found for Stanislaus. In the mandatory group in Stanislaus, the mean monthly percent of Medi-Cal enrollees having one or more authorized CCS claims was higher in 1995 (0.26 percent) compared to 1994 (0.10 percent, p=0.01), to 1996 (0.12 percent, p=0.03), and to 1997 (0.14 percent, p=0.07).

The results show a general increase in CCS claimants as a percent of Medi-Cal enrollees in the mandatory group. Children with CCS eligible medical diagnoses may be a more stable group of Medi-Cal beneficiaries with their Medi-Cal eligibility less likely to be affected by the economic improvements taking place in the mid-1990's. Thus it is not surprising that CCS claimants generally grew as a proportion of Medi-Cal enrollees, with or without a carve-out effect.

Because Medi-Cal enrollment was steady or increased in non-mandatory groups, the non-mandatory groups could show a different trend than the mandatory groups. The general time trend observed in the mandatory managed care group was seen for non-mandatory groups in fewer expansion counties. CCS claimant volume as a percent of Medi-Cal enrollees in 1997 was statistically different only from

Table 5.3 – Mean monthly CCS claimants as a proportion of Medi-Cal beneficiaries in California counties, annually for 1994—1997

Model	County	Non-mandatory [a]					Mandatory [a]				
		1994	1995	1996	1997	p value	1994	1995	1996	1997	p value
MC expansion counties—Early implementing counties (4)											
2-plan	Alameda	0.54%	0.64%	0.67%	0.82%	.00	0.14%	0.15%	0.18%	0.24%	.00
2-plan	Kern	0.46%	0.45%	0.48%	0.67%	.00	0.10%	0.10%	0.13%	0.22%	.00
COHS	Orange [b]	0.81%	0.71%	1.03%	1.18%	.00	0.18%	0.16%	0.27%	0.33%	.00
COHS	Santa Cruz [b]	0.92%	1.14%	1.48%	1.61%	.00	0.28%	0.30%	0.50%	0.62%	.00
Other MC expansion counties (10)											
2-plan	Contra Costa	0.57%	0.65%	0.67%	0.68%	.00	0.10%	0.13%	0.12%	0.20%	.00
2-plan	Fresno	0.66%	0.57%	0.59%	0.85%	.00	0.09%	0.08%	0.09%	0.20%	.00
2-plan	Los Angeles	0.72%	0.77%	0.81%	0.86%	.00	0.18%	0.18%	0.18%	0.17%	.00
2-plan	Riverside	0.67%	0.85%	0.88%	0.92%	.00	0.12%	0.12%	0.12%	0.14%	.00
2-plan	San Bernardino	0.82%	0.99%	1.17%	1.30%	.00	0.14%	0.13%	0.13%	0.15%	.00
2-plan	San Francisco	0.42%	0.42%	0.46%	0.57%	.00	0.17%	0.17%	0.16%	0.25%	.00
2-plan	San Joaquin	0.60%	0.72%	0.75%	0.89%	.00	0.10%	0.12%	0.13%	0.17%	.00
2-plan	Santa Clara	0.58%	0.68%	0.68%	0.64%	.00	0.15%	0.17%	0.17%	0.19%	.00
2-plan	Stanislaus	0.56%	0.85%	0.83%	0.86%	.00	0.10%	0.26%	0.12%	0.14%	.00
2-plan	Tulare	0.54%	0.56%	0.58%	0.68%	.00	0.10%	0.11%	0.11%	0.13%	.00
Other MC expansion counties—Unique MC models (3)											
MCN	Placer	0.38%	0.58%	0.71%	0.67%	.00	0.09%	0.14%	0.18%	0.16%	.00
GMC	San Diego	0.64%	0.89%	0.92%	1.05%	.00	0.12%	0.13%	0.13%	0.19%	.00
MCN	Sonoma	0.58%	0.78%	0.87%	0.95%	.00	0.17%	0.18%	0.18%	0.20%	.04
Other MC expansion counties—Not implementing CCS carve-out (5)											
COHS	Napa	0.62%	0.83%	1.03%	1.26%	.00	0.13%	0.17%	0.19%	0.19%	.01
GMC	Sacramento	0.61%	0.76%	0.87%	0.94%	.00	0.13%	0.16%	0.19%	0.20%	.00
COHS	San Mateo	0.60%	0.83%	0.77%	0.87%	.00	0.28%	0.33%	0.39%	0.50%	.00
COHS	Santa Barbara	0.54%	0.68%	0.87%	1.09%	.00	0.27%	0.27%	0.31%	0.33%	.00
COHS	Solano	0.16%	0.02%	0.05%	0.90%	.00	0.04%	0.00%	0.01%	0.15%	.00
Non-MC expansion counties—With voluntary MC (3)											
—	Madera	0.33%	0.35%	0.33%	0.44%	.00	0.10%	0.10%	0.10%	0.11%	.22
—	Marin	0.54%	0.63%	0.66%	0.66%	.03	0.21%	0.22%	0.28%	0.33%	.00
—	Yolo	0.43%	0.59%	0.58%	0.73%	.00	0.12%	0.09%	0.11%	0.17%	.00
Non-MC expansion counties (33)											
—	Alpine	0.78%	0.17%	0.91%	2.11%	.00	0.06%	0.11%	0.25%	0.09%	.46
—	Amador	0.69%	0.42%	0.61%	0.89%	.00	0.08%	0.10%	0.13%	0.18%	.07
—	Butte	0.75%	0.71%	0.82%	1.07%	.00	0.08%	0.10%	0.10%	0.13%	.00
—	Calaveras	0.60%	0.67%	0.60%	0.67%	.68	0.12%	0.12%	0.08%	0.11%	.21
—	Colusa	0.43%	0.40%	0.69%	0.46%	.00	0.10%	0.13%	0.13%	0.19%	.01
—	Del Norte	0.27%	0.27%	0.30%	0.30%	.89	0.06%	0.04%	0.06%	0.07%	.39
—	El Dorado	0.38%	0.45%	0.65%	0.81%	.00	0.10%	0.07%	0.14%	0.24%	.00
—	Glenn	0.57%	0.65%	0.96%	0.98%	.00	0.12%	0.10%	0.14%	0.19%	.02
—	Humboldt	0.55%	0.45%	0.50%	0.63%	.00	0.13%	0.12%	0.13%	0.13%	.60
—	Imperial	0.52%	0.54%	0.61%	0.71%	.00	0.10%	0.10%	0.10%	0.11%	.10
—	Inyo	0.15%	0.13%	0.33%	0.45%	.00	0.14%	0.06%	0.10%	0.10%	.16
—	Kings	0.28%	0.33%	0.26%	0.32%	.03	0.06%	0.08%	0.09%	0.10%	.00
—	Lake	0.38%	0.45%	0.48%	0.59%	.00	0.11%	0.15%	0.10%	0.17%	.00
—	Lassen	0.33%	0.22%	0.36%	0.44%	.00	0.07%	0.04%	0.05%	0.10%	.02

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Model	County	Non-mandatory [a]					Mandatory [a]				
		1994	1995	1996	1997	p value	1994	1995	1996	1997	p value
—	Mariposa	0.16%	0.28%	0.27%	0.36%	.33	0.04%	0.04%	0.06%	0.05%	.77
—	Mendocino	0.62%	0.65%	0.57%	0.70%	.01	0.14%	0.17%	0.16%	0.21%	.01
—	Merced	0.49%	0.62%	0.74%	0.88%	.00	0.08%	0.11%	0.12%	0.14%	.00
—	Modoc	0.06%	0.20%	0.36%	0.38%	.00	0.06%	0.00%	0.04%	0.08%	.00
—	Mono	0.44%	0.66%	0.37%	0.21%	.01	0.19%	0.20%	0.13%	0.08%	.18
—	Monterey	0.60%	0.79%	0.86%	0.82%	.00	0.20%	0.23%	0.19%	0.21%	.03
—	Nevada	0.76%	0.66%	0.75%	1.03%	.00	0.13%	0.12%	0.18%	0.21%	.00
—	Plumas	0.09%	0.11%	0.19%	0.37%	.00	0.05%	0.04%	0.09%	0.19%	.00
—	San Benito	0.79%	0.68%	1.18%	1.07%	.00	0.19%	0.19%	0.19%	0.17%	.91
—	San Luis Obispo	0.87%	1.19%	1.26%	1.33%	.00	0.23%	0.24%	0.25%	0.25%	.67
—	Shasta	0.43%	0.64%	0.69%	0.80%	.00	0.06%	0.09%	0.11%	0.11%	.00
—	Sierra	0.54%	0.72%	0.58%	0.34%	.35	0.13%	0.04%	0.04%	0.24%	.04
—	Siskiyou	0.32%	0.26%	0.29%	0.41%	.04	0.03%	0.07%	0.09%	0.12%	.00
—	Sutter	0.37%	0.32%	0.52%	0.64%	.00	0.14%	0.09%	0.13%	0.17%	.00
—	Tehama	0.29%	0.37%	0.49%	0.55%	.00	0.11%	0.11%	0.10%	0.13%	.38
—	Trinity	0.38%	0.61%	0.73%	0.82%	.00	0.07%	0.07%	0.06%	0.03%	.32
—	Tuolomne	0.65%	0.81%	0.72%	0.63%	.08	0.17%	0.11%	0.09%	0.12%	.00
—	Ventura	0.70%	0.91%	0.97%	1.04%	.00	0.12%	0.14%	0.13%	0.13%	.04
—	Yuba	0.40%	0.29%	0.38%	0.47%	.00	0.10%	0.06%	0.10%	0.11%	.00

[a] Mandatory managed care group status uses definition in place for Two Plan counties.
[b] Using COHS county definition of mandatory group, annual monthly means are as follows for the two COHS expansion counties. For Orange, non-mandatory means were 0.61% (1994), 0.30% (1995), 0.42% (1996), 0.51% (1997), p=0.00 (F(3,44)) and mandatory means were 0.33% (1994), 0.34% (1995), 0.53% (1996), 0.64% (1997), p=0.00 (F(3,44)). For Santa Cruz, non-mandatory means were 0.56% (1994), 0.50% (1995), 0.56% (1996), 0.62% (1997), p=0.31 (F(3,44)) and mandatory means were 0.48% (1994), 0.59% (1995), 0.87% (1996), 1.02% (1997), p=0.00 (F(3,44)).
p value for test of equality of means with F(3,44)

1994 in Contra Costa, Riverside, Santa Clara and Stanislaus). In Los Angeles it was statistically different from 1994 and from 1995 but not from 1996.

CCS Claimants as a Percent of Child Medi-Cal Enrollees

Figures on CCS participation among a more targeted base population—children 0-21 years of age enrolled in Medi-Cal—are provided in **Table 5.4, Monthly CCS claimants and Medi-Cal enrollees age 0-21 years in California counties: 1994-1998 (month of January)**. Because age-specific Medi-Cal enrollment data were only available for the months of January, this is the *only* month for which CCS claimants as a proportion of Medi-Cal beneficiaries age 0-21 years can be evaluated. Although January claimant volume is not necessarily representative of claimant activity for other months in the year, the figures in **Table 5.4** provide a "snapshot" of time trends for claimants as a proportion of the true base population. As before, this figure aggregates claimants in the mandatory and in the non-mandatory groups to capture trends in overall CCS claimant volume and in enrollment of children 0-21 years of age in Medi-Cal.

Overall, as when all Medi-Cal enrollees comprise the base population, CCS claimants appeared to increase as a proportion of child Medi-Cal beneficiaries over the study period. For example, in

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Table 5.4 – Monthly CCS claimants and child (0-21 years) Medi-Cal enrollment in California counties: 1994-1998 (Month of January)

County	1994			1995			1996			1997			1998		
	CCS clmt	MediCal enrollees 0-21 years	CCS/ Medi-Cal (%)	CCS clmt	MediCal enrollees 0-21 years	CCS/ Medi-Cal (%)	CCS clmts	MediCal enrollees 0-21 years	CCS/ Medi-Cal (%)	CCS clmts	MediCal enrollees 0-21 years	CCS/ Medi-Cal (%)	CCS clmts	MediCal enrollees 0-21 years	CCS/ Medi-Cal (%)
MC expansion counties—Early implementing counties (4)															
Alameda	474	103,912	0.46	564	106,280	0.53	568	105,788	0.54	725	99,740	0.73	709	91,905	0.77
Kern	217	75,025	0.29	223	81,622	0.27	271	86,722	0.31	446	87,061	0.51	438	84,815	0.52
Orange	1,027	162,617	0.63	1,015	166,847	0.61	1,197	166,412	0.72	1,648	156,296	1.05	1,287	137,459	0.94
Santa Cruz	103	14,063	0.73	152	15,321	0.99	212	15,145	1.40	238	14,521	1.64	215	13,019	1.65
Other MC expansion counties (10)															
Contra Costa	182	47,812	0.38	254	49,282	0.52	295	49,462	0.60	309	48,128	0.64	264	44,833	0.59
Fresno	404	129,179	0.31	474	130,010	0.36	432	131,093	0.33	555	126,996	0.44	849	119,965	0.71
Los Angeles	4,953	1,063,079	0.47	5,401	1,094,486	0.49	6,702	1,042,895	0.64	6,530	1,047,297	0.62	5,550	972,383	0.57
Riverside	442	118,139	0.37	501	124,498	0.40	689	129,934	0.53	695	127,374	0.55	687	118,046	0.58
San Bernardino	822	188,059	0.44	781	192,534	0.41	1,104	192,538	0.57	1,105	188,670	0.59	1,206	173,740	0.69
San Francisco	283	45,349	0.62	227	44,670	0.51	296	43,013	0.69	354	40,103	0.88	311	36,317	0.86
San Joaquin	253	69,230	0.37	286	69,595	0.41	307	71,296	0.43	372	70,953	0.52	418	67,473	0.62
Santa Clara	391	99,764	0.39	524	100,812	0.52	591	97,584	0.61	510	88,640	0.58	438	76,232	0.57
Stanislaus	173	49,895	0.35	276	52,170	0.53	290	52,879	0.55	243	52,704	0.46	315	49,434	0.64
Tulare	173	61,808	0.28	222	62,762	0.35	220	62,792	0.35	252	63,249	0.40	274	58,599	0.47
Other MC expansion counties—Unique MC models (3)															
Placer	29	9,040	0.32	47	9,175	0.51	51	8,950	0.57	60	8,682	0.69	51	7,893	0.65
San Diego	764	197,001	0.39	1,066	201,025	0.53	1,133	199,256	0.57	1,155	188,902	0.61	1,364	166,401	0.82
Sonoma	121	19,885	0.61	162	21,342	0.76	165	20,872	0.79	162	19,962	0.81	169	17,735	0.95
Other MC expansion counties—Not implementing CCS carve-out (5)															
Napa	41	5,813	0.71	33	5,990	0.55	63	6,004	1.05	74	5,846	1.27	31	5,145	0.60
Sacramento	544	127,590	0.43	565	131,761	0.43	784	133,010	0.59	885	133,076	0.66	855	129,733	0.66
San Mateo	172	25,969	0.66	240	27,598	0.87	233	27,368	0.85	289	25,214	1.15	251	22,131	1.13
Santa Barbara	156	27,612	0.56	176	28,902	0.61	233	28,690	0.81	276	28,239	0.98	250	25,070	1.00
Solano	75	23,689	0.32	6	24,761	0.02	4	25,292	0.02	67	25,779	0.26	197	24,625	0.80
Non-MC expansion counties—With voluntary MC (3)															
Madera	42	14,640	0.29	38	15,036	0.25	46	16,568	0.28	55	16,562	0.33	47	16,300	0.29
Marin	30	5,742	0.52	52	5,952	0.87	62	5,850	1.06	52	5,728	0.91	51	5,247	0.97

County	1994			1995			1996			1997			1998		
	CCS clmt	MediCal enrollees 0-21 years	CCS/Medi-Cal (%)	CCS clmt	MediCal enrollees 0-21 years	CCS/Medi-Cal (%)	CCS clmts	MediCal enrollees 0-21 years	CCS/Medi-Cal (%)	CCS clmts	MediCal enrollees 0-21 years	CCS/Medi-Cal (%)	CCS clmts	MediCal enrollees 0-21 years	CCS/Medi-Cal (%)
Yolo	54	13,025	0.41	58	13,170	0.44	41	13,159	0.31	76	13,372	0.57	82	12,592	0.65

Non-MC expansion counties (33)

County	1994			1995			1996			1997			1998		
Alpine	0	136	0.00	0	131	0.00	0	144	0.00	1	147	0.68	1	137	0.73
Amador	7	1,198	0.58	6	1,291	0.46	8	1,291	0.62	7	1,314	0.53	12	1,340	0.90
Butte	72	21,116	0.34	108	22,536	0.48	121	22,855	0.53	139	22,539	0.62	137	22,352	0.61
Calaveras	8	2,401	0.33	14	2,674	0.52	12	2,676	0.45	9	2,746	0.33	11	2,673	0.41
Colusa	6	1,976	0.30	7	2,255	0.31	10	2,270	0.44	9	2,095	0.43	8	2,164	0.37
Del Norte	10	3,295	0.30	6	3,397	0.18	10	3,550	0.28	2	3,572	0.06	10	3,532	0.28
El Dorado	20	6,501	0.31	19	6,960	0.27	31	6,899	0.45	36	6,559	0.55	47	6,208	0.76
Glenn	15	3,311	0.45	12	3,467	0.35	21	3,304	0.64	17	3,237	0.53	18	3,136	0.57
Humboldt	63	11,855	0.53	57	11,889	0.48	52	11,787	0.44	64	11,364	0.56	68	11,469	0.59
Imperial	70	20,687	0.34	63	21,417	0.29	75	21,235	0.35	78	21,056	0.37	72	20,359	0.35
Inyo	6	1,457	0.41	4	1,458	0.27	2	1,507	0.13	5	1,555	0.32	2	1,476	0.14
Kings	25	14,244	0.18	36	14,742	0.24	33	15,212	0.22	36	15,120	0.24	45	13,974	0.32
Lake	31	6,456	0.48	35	6,777	0.52	34	6,698	0.51	36	6,566	0.55	24	6,249	0.38
Lassen	9	2,587	0.35	3	2,745	0.11	8	2,712	0.29	8	2,673	0.30	7	2,535	0.28
Mariposa	2	1,144	0.17	0	1,230	0.00	1	1,199	0.08	1	1,202	0.08	2	1,204	0.17
Mendocino	43	8,356	0.51	52	8,657	0.60	51	9,238	0.55	47	8,979	0.52	60	8,734	0.69
Merced	115	36,789	0.31	142	39,111	0.36	161	39,325	0.41	193	38,317	0.50	194	34,664	0.56
Modoc	1	1,162	0.09	0	1,283	0.00	4	1,332	0.30	3	1,313	0.23	2	1,210	0.17
Mono	1	455	0.22	2	455	0.44	1	454	0.22	2	493	0.41	1	435	0.23
Monterey	156	31,701	0.49	180	33,338	0.54	252	33,322	0.76	184	31,668	0.58	178	29,583	0.60
Nevada	21	3,596	0.58	29	3,819	0.76	18	3,921	0.46	42	3,695	1.14	21	3,403	0.62
Plumas	2	1,430	0.14	0	1,598	0.00	6	1,588	0.38	5	1,391	0.36	5	1,348	0.37
San Benito	15	3,357	0.45	18	3,422	0.53	21	3,490	0.60	22	3,577	0.62	20	3,320	0.60
San LuisObispo	61	11,133	0.55	120	12,039	1.00	133	12,102	1.10	137	12,093	1.13	112	11,169	1.00
Shasta	54	16,230	0.33	67	16,793	0.40	88	17,745	0.50	102	18,098	0.56	90	17,632	0.51
Sierra	0	202	0.00	1	156	0.64	1	168	0.60	1	196	0.51	0	163	0.00
Siskiyou	10	4,830	0.21	5	4,945	0.10	17	4,938	0.34	18	4,801	0.37	15	4,326	0.35
Sutter	28	7,321	0.38	26	7,561	0.34	26	7,337	0.35	39	7,206	0.54	35	7,319	0.48
Tehama	10	6,452	0.15	16	6,480	0.25	24	6,680	0.36	22	6,293	0.35	24	6,052	0.40
Trinity	5	1,305	0.38	5	1,244	0.40	5	1,241	0.40	5	1,262	0.40	7	1,189	0.59
Tuolomne	15	3,274	0.46	16	3,424	0.47	13	3,612	0.36	13	3,461	0.38	16	3,325	0.48
Ventura	154	41,255	0.37	251	42,837	0.59	290	43,492	0.67	311	42,501	0.73	282	39,399	0.72
Yuba	36	10,706	0.34	26	10,972	0.24	35	11,413	0.31	23	10,991	0.21	41	10,213	0.40

CCS claimant figures from original tabulations of CCS-authorized Medi-Cal claims. Total CCS claimants shown in January 1998 column are counts from December 1997

Alameda County, CCS claimants as a percent of child Medi-Cal enrollees for January 1994 through January 1998 were 0.46 percent, 0.53 percent, 0.54 percent, 0.72 percent, and 0.77 percent.[61] Using all non-aged Medi-Cal enrollees as the base population, the rate increased from 0.26 percent (1994) to 0.41 percent (1997). Stratifying by managed care group shows increases for both groups. For Alameda, the rate increased from 0.22 in January 1994 to 0.35 percent in January 1998 in the mandatory group and increased from 2.1 percent to 2.6 percent in the non-mandatory group (data not shown). Apparent *declines* in 1997 relative to earlier years were evident for Los Angeles and Santa Clara counties. For these counties, lower rates of CCS claimants as a percent of child beneficiaries were found in 1997 and 1998 relative to the years 1994-96 when rates appeared to be increasing for the mandatory as well as for the non-mandatory group. Possible explanations include greater Medicaid eligibility loss for children in Santa Clara and Los Angeles counties due to parent work participation or other economic change, or due to loss of SSI-linked Medicaid eligibility.

5.2   Multivariate Analysis of CCS Claimant Volume

As described earlier, the multivariate analysis of claimant volume specifies total monthly claimant volume as a function of monthly Medi-Cal enrollment, of participation in pre-carve-out (voluntary) managed care, of year and seasonal effects, and of a carve-out measure. In addition to other explanatory variables in the multivariate specification, most models include county fixed effects. Variables in the multivariate specifications are described in **Table 5.5, Glossary of variables in multivariate models**.

As discussed earlier, there are several ways that the carve-out could affect CCS authorizations and thereby total monthly claimant volume. One way is that physicians and/or health plans refer more children to CCS than had been referred in the past, and/or identify more services as potentially CCS related. This could happen incrementally as increasing numbers of children are exposed directly to the carve-out incentives. Alternatively it could take place as a shift that affects provider behavior overall, for children in the mandatory group and possibly extending to children in the non-mandatory group as well. Another way is that the Medi-Cal field offices could cause more referrals to CCS. This is more likely to occur as a one-time shift (i.e., as an across the board change to policies and procedures) that could apply to all children for whom authorizations are requested. Because Medi-Cal field offices would not receive authorization requests for children who are participating in managed care (because only the CCS authorization process remains as a FFS option for them), any Medi-Cal field office effect would extend to children not in managed care. Most of these children are in the non-mandatory group. The explanation that Medi-Cal deferred authorizations would occur for mandatory eligibles who for some reason are not yet participating in managed care, but not for non-mandatory eligibles, seems less plausible from an organizational perspective. The third way is through CCS authorization changes. To the extent that any Medi-Cal changes in deferring to CCS dominate the effect, the timing of the Medi-Cal changes will be most relevant. Otherwise the CCS role in a carve-out effect would

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[61] CCS claimants from December 1997 are combined with Medi-Cal enrollment from January 1998 to proxy for a January 1998 rate.

Table 5.5 – Glossary of variables for multivariate models

Variable	Definition
Dependent	
ln_clmt	Log of mean monthly # of CCS claimants in a county by aidcode group
ln_stpd	Log of total expended on CCS claims in a county by aidcode group
ln_sclmt	Log of mean expended monthly per CCS claimant in a county by aidcode group
Independent	
PCT2CPLI	Percent participating in post carve-out managed care plan (MCP) in Two Plan Model
P1_CPLI	Percent in MCP during pre default carve-out months; 0 if otherwise
P2_CPLI	Percent in MCP during post default carve-out months; 0 if otherwise
PCT2COHS	Percent participating in post carve-out managed care plan (MCP) in COHS
PCT_MCP	Percent participating in post carve-out managed care plan (MCP) in any expansion county
LN_S_ENR	Log of total Medi-Cal enrolled in county in month
PCT2_PHP	Percent participating in "CCS-include" PHPs during pre-expansion period
AFFECT	Dummy indicating managed care requirement status (1 if aidcode requires participation in managed care; 0 if otherwise)
POST	Dummy indicating managed care expansion period (1 if post carve-out period; 0 if otherwise)
POST1_A	Dummy indicating pre default carve-out months where Two Plan model not fully operational (1 if post carve-out and no default assignment; 0 if otherwise)
POST2_A	Dummy indicating post default carve-out months where Two Plan model fully operational (1 if post carve-out and default assignment; 0 if otherwise)
AF_P, AF_P1, AF_P2	Interaction terms for POST*AFFECT indicating post period for mandatory group, pre default post period for mandatory, post default period for mandatory
COUNTY C01 through C58	Dummy indicating county of residence (1 if resident of the county; 0 if otherwise)

YEAR
    YEAR1, YEAR2,
    YEAR3, YEAR4
	Dummy indicating year (1994; 1995; 1996; 1997)

QUARTER
    QTR1, QTR2,
    QTR3, QTR4
	Dummy indicating season/quarter (Quarter 1/Winter; Quarter 2/Spring; Quarter 3/Summer; Quarter 4/Fall)

take place on an incremental basis as more children participate in the prepaid health plans and are directly subjected to carve-out incentives.

The specifications that use a pre-post indicator treat the financial incentives and any other changes associated with the carve-out as effective on the carve-out date. This represents the theory that there was a level shift in referral practice patterns. Some combination of the relevant actors—physicians, hospitals, Medi-Cal field offices, CCS programs—made operational changes in response to the carve-out. These changes may apply to all beneficiaries or may be largely restricted to the mandatory group. The continuous MCP participation rate specifications capture the actual proportion of the base population that is directly exposed to the carve-out incentives. This represents the theory that an incremental change took place in response to each "encounter" with the referral incentive. These are not necessarily competing theories. Each could exert some influence within an overall carve-out effect. Because all of these mechanisms are plausible and consistent with the reported observations from CCS administrators, both specification approaches are undertaken.

Some multivariate models pool aid categories, combine counties, or both. In models that pool aid categories into mandatory and non-mandatory groups, the COHS expansion counties and Two Plan model expansion counties are *not* combined. This is because managed care requirements differ between the COHS and the Two Plan counties for a number of aid categories.

5.2.1 Claimant Volume Specifications for Two Plan Counties

Separate models were evaluated to determine whether claimant volume increased following the carve-out for the mandatory aid categories group and for the non-mandatory aid categories group.[62] In these specifications, the carve-out effect is captured by a "post" term that is defined for each expansion county based on the date that the carve-out first became effective. Specifically, it has a value of one at the earliest date that a managed care plan operating with a CCS carve-out experienced any enrollment. This is a conservative effective date as some counties offered voluntary managed care participation (under the carve-out policy) for several months prior to the actual mandate becoming effective. Results for these models are provided in **Table 5.6, Pre and post carve-out CCS claimants, using post indicators—Two Plan model counties, by mandatory managed care group**.

The coefficient for the "post" variable in the mandatory group was 0.08, which was in the hypothesized direction but not statistically significant (p=0.17). The 95 percent confidence interval for the point estimate was (-0.04, 0.21). The year dummies suggested a time trend of increasing claimant volume. To examine the sensitivity of the Post effect to inclusion of the year dummies, another specification with the year dummies constrained to be zero was evaluated. In this specification, the coefficient for the carve-out policy effect in the mandatory group increased to 0.25 (confidence interval 0.04, 0.46) and was statistically significant (p=0.02). These results show that overall claimant volume did increase within the mandatory managed care group in the post carve-out

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[62] The independent variables in these specifications included log(Medi-Cal enrollment), log(PHP enrollment), 3 seasonal dummies, 3 year dummies, and 11 county fixed effects.

Table 5.6 – Pre and post carve-out CCS claimants, using post indicators – Two Plan model counties, by mandatory managed care group

Variable	Pre-post indicators						Difference-in-difference	
	Non-mandatory aidcodes			Mandatory aidcodes				
	(1)	(2)	(3)	(1)	(2)	(3)	(4)	(5)
Post carve-out indicator (post)	0.028 (0.728)	0.008 (0.223)	---	0.084 (1.452)	0.016 (0.410)	---	0.028 (0.785)	---
Post carve-out with default (post2_a)	---	0.091 (2.314)	0.099 (2.360)	---	0.332 (4.140)	0.348 (3.850)	---	0.071 (1.110)
Post carve-out, no default (post1_a)	---	---	0.008 (0.223)	---	---	0.016 (0.410)	---	0.070 (2.072)
Post carve-out, no default, & mandatory group (af_p1)	---	---	---	---	---	---	---	-0.148 (2.522)
Post carve-out with default, & mandatory group (af_p2)	---	---	---	---	---	---	---	0.156 (2.047)
Mandatory group indicator (affect)	---	---	---	---	---	---	-0.774 (10.56)	-0.866 (11.14)
Post carve-out & mandatory group (af_p)	---	---	---	---	---	---	0.005 (0.070)	---
Log Medi-Cal enrolled (ln_s_enr)	1.707 (3.382)	1.873[a] (3.272)	1.873[a] (3.272)	1.498 (2.866)	1.792[a] (6.048)	1.792[a] (6.048)	0.152[a] (1.851)	0.227[a] (2.831)
Percent PHP (pct2_php)	0.032 (2.502)	0.038 (3.477)	0.038 (3.477)	-0.005 (0.752)	0.002 (0.244)	0.002 (0.244)	-0.004 (0.725)	-0.000 (0.055)
1995	0.079 (1.967)	0.070 (1.910)	0.070 (1.910)	0.122 (1.718)	0.110 (1.504)	0.110 (1.504)	0.137 (2.590)	0.132 (2.470)
1996	0.079 (1.644)	0.062 (1.519)	0.062 (1.519)	0.102 (2.052)	0.086 (1.549)	0.086 (1.549)	0.158 (3.467)	0.150 (3.584)
1997	0.243 (5.229)	0.196 (4.783)	0.196 (4.783)	0.365 (4.266)	0.254 (3.158)	0.254 (3.158)	0.309 (7.459)	0.249 (5.959)
N	576	576	576	576	576	576	1,152	1,152
R squared	0.98	0.98	0.98	0.95	0.96	0.96	0.96	0.96

(1) Uses one post carve-out indicator
(2) Uses post carve-out indicator and a post default indicator
(3) Uses indicators for post carve-out (no default) and post carve-out (default)
(4) Uses post carve-out indicator, interaction with mandatory group, and mandatory group main effect
(5) Uses 2 post carve-out indicators, interactions with mandatory group, and mandatory group main effect
Each model includes 11 county and 3 season dummy variables; the omitted county is Tulare County, and the omitted season is Jan-Mar; in the specification with year dummies, the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed. [a] Can reject hypothesis that ln_s_enr = 1, $p<0.05$

period in Two Plan counties by an average of 28 percent.[63] However, the increase was not statistically significant when year dummies were used to control for the unknown but possible programmatic or other time variant changes that could be unrelated to the carve-out. Thus a "conservative" approach that treats post-carve-out claimants as exposed to carve-out effects, despite low participation in the early months, does not identify a statistically significant increase.

There also was not evidence of a significant carve-out effect on claimant volume in the non-mandatory aid categories group. The coefficient for the "post" variable in the regression for the non-mandatory group was 0.03 and not statistically significant. In the specification that constrained the year dummies to be zero, the coefficient for the carve-out policy effect was 0.15 and statistically significant (p=0.01) with a 95 percent confidence interval of (0.04, 0.25). This result is similar to the findings for the mandatory managed care group, although it suggests a smaller magnitude effect for the non-mandatory group.

Adding a term for the post carve-out period when default assignment was operational (i.e., when managed care truly became mandatory) produced a statistically significant result. For the mandatory group, the coefficient for the post default indicator was 0.33 (confidence interval for the estimate of (0.16, 0.51)) as shown in Model 2 in **Table 5.6**. The post default indicator for the non-mandatory group also was significant although smaller at 0.09 (p=0.04). An alternate specification (Model 3) using a dummy variable for post carve-out without default, and dummy variable for post carve-out with default, showed that the post default period was associated with a 42 percent increase in monthly claimants for the mandatory group and a 10 percent increase for the non-mandatory group. These findings suggest that the carve-out effect was concentrated in the post default months and did not produce a level shift across the post period.

Coefficients for the season/quarter dummies (data not shown) showed that claimant volume was slightly higher in all quarters relative to the months of January through March. The coefficients were generally statistically significant and indicated approximately a 0.05 percent increase in claimant volume for each of the three seasons relative to the referent season/quarter. This pattern held for non-mandatory and mandatory groups.

The expected positive and significant association between Medi-Cal enrollment and claimant volume was found. For the non-mandatory group, monthly Medi-Cal enrollment also had a positive and statistically significant association with monthly claimant volume. However, the hypothesis that a one percent increase in CCS claimants results from each one percent increase in Medi-Cal enrollment was rejected only for the mandatory group (95 percent confidence interval of (1.14, 2.44))when multiple post indicators were used. For the non-mandatory group, a one percent increase in Medi-Cal enrollment was associated with a 1.87 percent increase in CCS claimants (95 percent confidence interval of (0.61, 3.13)).

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[63] The effect for the post dummy variables is $e^{\beta}-1$.

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PHP participation was not associated with CCS claimant volume in the mandatory group although the coefficient was negative, as hypothesized. In contrast, PHP participation *was* associated with higher claimant volume for the non-mandatory group. This is not consistent with hypotheses about PHP effects. Medi-Cal enrollment increases over time—and specifically trends in SSI participation (growth) that are correlated with PHP participation trends—may contribute to this finding. If there was higher enrollment of SSI-linked Medi-Cal beneficiaries that coincided with the months of higher PHP participation, then the PHP variable could be capturing some of the Medi-Cal enrollment effect.

In summary, claimant volume increased with the mandatory (default) phase in the Two Plan expansion counties The pre-post specifications do not show a carve-out effect during the pre-default months or significant effect when all post carve-out months are represented by a single post indicator. The effect appeared larger for the mandatory group than for the non-mandatory group.

Difference-in-Differences Specifications

In the difference-in-differences specifications—which compare carve-out impact for the mandatory and non-mandatory groups—the carve-out policy also is represented by a dummy variable that takes on a value of one for any month following carve-out implementation in the specific county, and a value of zero otherwise. These models include a main effect for the mandatory group (vs. the non-mandatory aid categories group) in addition to the main effect for the post carve-out period. The difference-in-differences estimate is represented by the interaction of affect*post, or by two interaction terms of mandatory group with pre and post default indicators. This specification treats the pre-post effect as equivalent for each Two Plan model county. Interaction terms that allow the effect to differ by county (e.g., affect*post*county terms) are not included.

Results are provided in **Table 5.6**. Controlling for fixed county differences and for Medi-Cal caseload and time trends, there is no statistically significant pre-post difference in the total number of monthly CCS claimants between the mandatory and non-mandatory groups (Model 4). The coefficient that captures the difference between the post effect for the mandatory managed care group and the non-mandatory group is 0.005. The coefficient for the common post carve-out time trend was 0.03 and also not significant. Using dummy variables for the post carve-out period without default, and for the post carve-out with default, showed that the change unique to the mandatory group was negative with no default (coefficient of –0.15, p=0.03) and positive with default (coefficient of 0.16, p=0.06) (Model 5). The default period increase falls between the mandatory and non-mandatory group findings, at 0.23 (sum of 0.071 and 0.156).

The coefficients for year dummies are all positive and statistically significant, indicating a time trend of increased claimant volume. These time trend variables are included in the model to separate unknown time trends that are unrelated to the carve-out policy from the measure of the policy's effect. As in the pre-post comparison, the change indicators were sensitive to the inclusion of year dummies. When the year dummies are excluded from the model (retaining county fixed effects)—data not shown—the coefficient for "post" increased from 0.03 to 0.21 and was statistically significant at p<0.001 (with 95 percent confidence interval of 0.14, 0.29). The DD estimate (the coefficient for the

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post*affect interaction term) did *not* change, however. This indicates that while the time trend variables are capturing program-wide increased participation, they are not picking up changes to CCS claimant volume that are unique to the mandatory managed care group.

The coefficient for Medi-Cal enrollment was positive (0.15) with 95 percent confidence interval of (−0.03, 0.33). This suggests inelasticity of CCS claimant volume with respect to Medi-Cal enrollment, at least within the range of the enrollment changes observed during the study period. This is not surprising, particularly given that enrollment changes in the study period have been associated with economic changes and that such changes might affect child Medi-Cal beneficiaries with CCS diagnoses less than the average Medi-Cal beneficiary. The null hypothesis that a one percent change in Medi-Cal enrollment corresponds to a one percent change in CCS claimant volume can be rejected ($p<0.05$).

Another finding from this specification is the impact of PHP participation on CCS claimant volume. The PHP term represents the monthly percent of Medi-Cal beneficiaries who participated in a managed care plan that included CCS services in its contract and thereby accepted financial risk for services related to CCS-eligible medical diagnoses. A statistically significant, negative coefficient for this variable would be consistent with an explanation that prepaid health plans enrolled children with CCS-eligible medical diagnoses and thus reduced the CCS claimant pool in the fee-for-service system. The coefficient for participation in such "CCS-include" prepaid health plans did not differ from zero in the mandatory or in the DD models. Thus the null hypothesis that participation in prepaid health plans does not affect monthly CCS claimant volume cannot be rejected. A 95 percent confidence interval calculated for the elasticity indicated by this coefficient did not include -1. Thus a one percent *decline* in monthly CCS claimants given a one percent increase in monthly PHP participation could be rejected.

Continuous Carve-out Effect Measure

The next set of multivariate specifications uses a different representation of the carve-out effect. This specification substitutes a continuous variable of percent participation in managed care for the dummy variables that were used to represent the policy impact in the earlier models. In contrast to the difference-in-differences specifications, this specification explicitly accounts for the rate of managed care participation[64]. Mean managed care participation rates are provided in **Table 5.7, Mean percentages for managed care regression variables, by mandatory group status—Expansion and non-expansion counties**. The mean participation rates for the mandatory group in Two Plan counties were 14.9 percent for the four year study period, and 49.0 in the post carve-out period

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[64] As discussed in Chapter 3, in the Two Plan counties, post-carve-out MCP participation for individuals in the non-mandatory aid categories is *voluntary*. Thus MCP participation by the non-mandatory group is subject to a set of potential "selection" effects that could differ from experience for the mandatory aid categories. There is no information on how voluntary participants differed from those in fee-for-service. This issue also extends to the mandatory group. There are no data on how characteristics of mandatory group individuals participating in MCPs during the transition period might differ from characteristics of participants when MCP participation levels had increased to more stable levels (i.e., 75 percent or above).

Table 5.7 – Mean percentages for managed care regression variables, by mandatory group status—Expansion and non-expansion counties

Variable	Mean monthly percentage					
	Expansion counties [a]		Expansion and 8 non-expansion independent CCS counties [b]		Expansion & 11 non-expansion independent CCS counties, matched urban-rural[c]	
	Non-Mandatory	Mandatory	Non-Mandatory	Mandatory	Non-Mandatory	Mandatory
	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)
Percent managed care (MCP) participation						
Two Plan	1.35 (2.51) (N=576)	14.89 (28.08) (N=576)	0.81 (2.05) (N=960)	8.93 (22.93) (N=960)	0.70 (1.93) (N=1,104)	7.77 (21.60) (N=1,104)
Two Plan, post carve-out	4.44 (2.64) (N=175)	49.01 (30.39) (N=175)				
Two Plan, post carve-out, no default	2.49 (1.86) (N=76)	22.75 (18.00) (N=76)				
Two Plan, post carve-out & default	5.94 (2.13) (N=99)	69.18 (21.11) (N=99)				
COHS	0.07 (0.12) (N=96)	49.74 (50.04) (N=96)	0.01 (0.06) (N=480)	9.95 (29.89) (N=480)	0.01 (0.05) (N=624)	7.65 (26.54) (N=624)
Percent PHP participation						
Two Plan	1.31 (1.80) (N=576)	6.11 (9.03) (N=576)	0.84 (1.52) (N=960)	3.81 (7.56) (N=960)	0.78 (1.48) (N=1,104)	3.55 (7.30) (N=1,104)
COHS	0.00 (N=96)	3.57 (6.20) (N=96)	0.00 (N=480)	0.95 (3.14) (N=480)	0.00 (N=624)	1.08 (3.41) (N=624)

N in each cell refers to total county-months contributing to the measure.
[a] N=576 (12 Two Plan counties) and N=96 (2 COHS counties)
[b] N=960 (12 Two Plan counties & 8 expansion) and N=480 (2 COHS counties & 8 expansion)
[c] N=1,104 (12 Two Plan counties & 11 expansion) and N=624 (2 COHS counties & 11 expansion)

(further disaggregated to 22.8 percent during the post period without default, and 69.2 percent during the post period with default).

Table 5.8, Regression results for CCS claimants using continuous MCP specification—Two Plan model counties, provides regression results separately for the mandatory managed care aid categories group and the non-mandatory group in Two Plan model counties. This specification combines observations from the 12 Two Plan model expansion counties, including counties that fully

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implemented during the study period as well as several counties (Riverside and San Bernardino) that maintained voluntary participation for all Medi-Cal beneficiaries throughout the study period. In this specification, the coefficient for managed care participation is the best overall representation of the carve-out effect for the Two Plan model in California, combining all of the Two Plan model counties. As discussed earlier, a set of time trend variables was included in the specifications to adjust for possible cyclical patterns in CCS claimant volume (e.g., due to epidemiological factors) and to adjust for possible (time variant) CCS program changes during the study period that affected CCS eligibility or authorization policies or protocols across counties.

For the mandatory group, the results show a positive and statistically significant coefficient (0.006) for the managed care participation variable. This suggests that there was a significant impact of the carve-out on CCS program participation. Using the mean managed care participation rate of 14.89, a one percent increase in monthly managed care participation was calculated to produce a 0.09 percent increase in monthly CCS program participation. The 95 percent confidence interval for this elasticity was (0.04, 0.15). (The coefficients for the year dummies also show a trend toward growth in CCS participation that is independent of the carve-out effect.)

Model 2 in **Table 5.8** shows that claimant volume increased with managed care participation in periods with and without default, for the mandatory group. Coefficients were significant for a rate of MCP participation in the initial months of the carve-out, and for a rate of MCP participation in the post default months of the carve-out. The coefficients indicate a 0.42 percent increase in claimant volume associated with a one percent MCP increase in the post default period, and a 0.07 percent increase associated with one percent MCP increase in the post carve-out period without default.

Continuing with the results for the mandatory group, **Table 5.8** also shows the association between CCS claimant volume and total Medi-Cal enrollment. The coefficient for total monthly Medi-Cal enrollment was 1.87 for the mandatory group and statistically significant (95 percent confidence interval 1.18, 2.56). Thus the hypothesis that Medi-Cal enrollment does not affect CCS participation can be rejected. Further, the null hypothesis that a one percent increase in Medi-Cal enrollment causes a one percent increase in CCS claimant volume also can be rejected ($F(1,11)$, p=0.02). The reason that a one percent change in Medi-Cal enrollment would change CCS claimant volume by more than one percent, as indicated by this result, is not clear.

Participation in PHPs prior to the carve-out did not appear to affect CCS claimant volume in the mandatory group. This would support the hypothesis that voluntary participation of Medi-Cal beneficiaries in "CCS-include" prepaid health plans did not alter the volume of monthly CCS claimants. A 95 percent confidence interval calculated for the elasticity shows that it is possible to reject the hypothesis that the coefficient is equal to negative 1 (which would have indicated that a one percent increase in PHP participation reduced CCS volume by one percent). The findings are consistent with an explanation that few children with CCS eligible medical diagnoses were enrolled in the PHPs, and/or with an explanation that children did not remain enrolled in the PHPs once identified with a CCS eligible medical diagnosis.

Table 5.8 – Regression results for CCS claimants using continuous MCP specification – Two-plan model counties (coefficients and t statistics)

Variable	OLS for log(claimants)			
	Non-mandatory		Mandatory	
	(1)	(2)	(1)	(2)
Percent MCP (pct2cpli)	0.027 (6.882)	---	0.006 (4.403)	---
Indicator for post carve-out (post)	-0.032 (0.912)	---	-0.073 (1.673)	---
Percent MCP, with default (p2_cpli)	---	0.027 (2.422)	---	0.006 (3.547)
Indicator for post default (post2_a)	---	-0.028 (0.340)	---	-0.052 (0.554)
Percent MCP, no default (p1_cpli)	---	0.022 (1.771)	---	0.003 (3.239)
Indicator for post, no default (post1_a)	---	-0.025 (0.930)	---	-0.024 (0.665)
log Medi-Cal enrolled (ln_s_enr)	1.559 (3.197)	1.598 (3.185)	1.917 (6.608)	1.972 (7.873)
Percent PHP (pct2_php)	0.046 (4.626)	0.046 (4.850)	-0.001 (0.211)	-0.000 (0.028)
1995	0.080 (2.084)	0.079 (2.134)	0.114 (1.618)	0.113 (1.583)
1996	0.079 (1.882)	0.076 (1.950)	0.094 (2.009)	0.092 (1.913)
1997	0.190 (4.280)	0.186 (4.763)	0.225 (2.846)	0.222 (2.832)
R squared	0.98	0.98	0.96	0.96

Each model also includes 11 county and 3 season dummy variables; the omitted county is Tulare County, the omitted year is 1994, and the omitted season is Jan-Mar. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed. N=576

Table 5.8 also provides regression results for the non-mandatory managed care group. As stated earlier, while the difference-in-differences specification treated the non-mandatory groups as unaffected by the carve-out, this specification recognizes that these eligibles could voluntarily enroll in Medi-Cal managed care and thus be directly subjected to the carve-out effects. This is because any Medi-Cal beneficiary choosing to enroll in a managed care plan in the post-carve-out period would receive Medi-Cal services under provisions of the carve-out policy.

This specification produced a significant coefficient of 0.027 for the managed care participation variable. Like the result for the mandatory managed care group, this finding suggests a significant impact of the carve-out on CCS participation. A one percent increase in managed care participation was associated with a 0.04 percent increase in CCS participation. The coefficients for the year dummies show a trend toward growth in CCS program participation each year, which is consistent with the results for the mandatory group.

Model 2 in **Table 5.8** shows that claimant volume increased with managed care participation in the default period but not in the default period, for the non-mandatory group. The coefficients indicate a 0.07 percent increase in claimant volume associated with a one percent MCP increase in the post default period, and a 0.05 percent increase associated with one percent MCP increase in the post carve-out period without default.

The results of this specification also show that monthly CCS claimant volume in the non-mandatory group was affected by Medi-Cal enrollment. The hypothesis that the coefficient is equal to one (1), indicating a one percent CCS increase for a percent increase in Medi-Cal enrollment, could not be rejected. The findings for PHP participation differed from the mandatory managed care group. The coefficient suggested that increased PHP participation led to an increase in CCS claimant volume. This is not consistent with the hypothesis that enrollment of Medi-Cal eligibles into prepaid health plans did not alter the volume of CCS claimants. It is not clear why a positive association would be found and may stem from the low variability in PHP participation rates for the non-mandatory group. The proportion of Medi-Cal eligibles in the non-mandatory groups that enrolled in these PHPs is known to be quite small (reaching at most 5 percent in some months when pooling all aid categories and combining Two Plan model counties). Thus any increase in CCS claimant volume that is associated with PHP participation would have a small magnitude relative to the overall caseload.

Sensitivity to model specification

The way that time trend and other variables are specified in the models may affect the magnitude and significance of the carve-out effect indicator. Results for several different specifications are provided in **Table 5.9, Sensitivity of MCP coefficients to alternative specifications—Two Plan model counties**.

As discussed earlier, the PHP participation variable was included in the models to ensure that any increased CCS participation due to CCS-eligible children disenrolling from CCS-include PHPs at the start of the carve-out would not be captured in the coefficient for post-carve-out managed care participation. The impact on the carve-out effect coefficient when PHP participation is not incorporated in the model is illustrated in the first and second rows of **Table 5.9**.

The coefficient for PHP participation had been negligible and non-significant in the models for the mandatory managed care group. Adding the PHP variable to the specification generally did not affect the value of the coefficient for the carve-out policy impact variable. There was little impact of not including the PHP variable when assessing the statewide impact of the carve-out policy. While CCS-

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Table 5.9 – Sensitivity of MCP coefficients to alternate specifications, claimant volume— Two Plan model counties

Specification	Dependent variable OLS for log(claimants)	
	Non-mandatory	Mandatory
All twelve (12) 2-plan counties (n=576) with PHP variable	0.027 (6.682)	0.006 (4.403)
All twelve (12) 2-plan counties(n=576) without PHP variable	0.017 (1.912)	0.006 (5.112)

All twelve (12) 2-plan counties (n=576)
    with PHP variable
    no county fixed effects
	0.009
	(0.591)
		0.006
		(4.853)

All twelve (12) 2-plan counties (n=576)
    without PHP variable
    no county fixed effects
	0.005
	(0.331)
		0.006
		(5.350)

Four (4) late implementing counties deleted (n=384) with PHP variable	0.027 (3.579)	0.004 (3.579)
Four (4) late implementing counties deleted (n=384) without PHP variable	0.017 (1.522)	0.004 (4.051)

Each model includes a post carve-out (0,1) indicator, 3 year dummies, and 3 season dummy variables; the omitted county is Tulare County, the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors with assumption of independence within groups (county) relaxed. Models with 12 counties have 576 observations, and models with 8 counties have 384 observations.

include PHP participation did reach and sustain 30 percent of Medi-Cal eligibles in some counties in the months prior to the carve-out, the findings suggest that when averaging the experience of the counties, this PHP participation did not affect monthly CCS claimant volume.

In contrast, adding the PHP variable to the specification does affect the value of the carve-out policy coefficient in the non-mandatory managed care group. Adding the PHP variable increased the carve-out policy coefficient from 0.017 to 0.027 with a smaller standard error. As stated earlier, the lack of variability in this variable for the non-mandatory group may contribute.

Because the Two Plan model counties implemented their managed care expansions at different times during the study period, the length of the follow-up (post carve-out) period varies by county. Moreover, several of the counties initiated the default assignment process *after* the study period ended. It might be argued that while all counties experienced a post-carve-out transition period, these later-implementing counties did not reach the "stable" level of managed care participation during the study period that earlier implementing counties may have achieved. To get an estimate of the elasticity for the eight earlier implementing Two Plan counties, a specification was tested that excluded the four latest implementing Two Plan model counties. Results for this specification are illustrated in rows five and six in **Table 5.9**.

There was not evidence that including the late implementing counties lessened the carve-out effect estimate. When the four late implementing Two Plan counties were dropped, the coefficient for MCP participation in the mandatory group fell slightly from 0.006 to 0.004. For the non-mandatory aid categories, there also was relatively little change to the coefficient for MCP participation, although the standard error increased with the loss of observations.

Individual Two Plan Counties

Prior specifications evaluated the average managed care effect in the expansion counties. While the carve-out policy applied to all expansion counties, its effect may have varied due to county differences in implementation and/or in pre-carve-out environment. There are a number of possible reasons for variation in response to MCP participation across the Two Plan model counties. These include different experience of the local provider network with managed care, different response on the part of the local CCS program, different profiles of voluntary PHP participants with respect to CCS eligibility, and different protocols/practices on the part of the local Medi-Cal field office, among others. The rate of increase in MCP participation also differed by county, due in large part to variability in the time period between earliest voluntary participation and the default effective date. Moreover, covariates of Medi-Cal enrollment and PHP participation may have different effects by expansion county. For example, PHP participants may have differed by county. Because covariate effects may differ, regressions were evaluated for individual counties in addition to the specifications that combined counties.

Results are provided in **Table 5.10, Regression results for claimant volume in Two Plan model counties, by county**. As discussed in the previous section, the coefficient for the managed care participation variable was 0.006 for the mandatory group and 0.027 for the non-mandatory group when Two Plan counties were combined. The county-specific models—ordered in **Table 5.10** by the date that the county first enrolled beneficiaries into the Two Plan model—indicate some variation across the counties in the impact of the MCP participation rate.

Mandatory managed care group

Results for the mandatory group are provided in Model 2 in **Table 5.10**. Six (6) of the 11 Two Plan counties that implemented managed care during the study period showed a positive and statistically

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Table 5.10 – Regression results for claimant volume in Two-Plan Model counties, by county

County	Dependent variable=log(claimant volume)							
	Non-mandatory				Mandatory			
	(1) Percent MCP pct2cpli	(2) Percent MCP pct2cpli	(2) Percent PHP pct2_php	Medi-Cal enrolled ln_s_enr	(1) Percent MCP pct2cpli	(2) Percent MCP pct2cpli	(2) Percent PHP pct2_php	Medi-Cal enrolled ln_s_enr
Alameda	0.027 (2.920)	0.032 (1.189)	0.034 (0.199)	1.286 (1.080)	0.002 (2.344)	0.004 (1.852)	0.169 (0.969)	0.307 (0.372)
Kern	---	0.015 (1.049)	---	0.096 (0.125)	---	0.006 (2.939)	---	0.435 (0.474)
Contra Costa	-0.021 (0.783)	-0.076 (1.326)	-0.110 (1.084)	-0.022 (0.008)	0.004 (2.175)	0.004 (1.546)	0.001 (0.034)	3.500 (1.820)
Fresno	---	0.008 (0.486)	---	-1.738 (0.934)	---	0.008 (5.339)	---	-1.220 (1.017)
San Francisco	0.018 (1.224)	0.012 (0.323)	-0.018 (0.159)	2.879 (1.520)	0.001 (0.311)	0.013 (1.836)	0.081 (1.871)	-1.932 (0.793)
San Joaquin	0.002 (0.158)	0.003 (0.232)	0.101 (0.702)	0.213 (0.126)	0.000 (0.086)	0.000 (0.166)	-0.262 (1.215)	2.179 (0.793)
Santa Clara	0.004 (0.138)	0.031 (0.646)	0.090 (0.681)	3.815 (2.304)	0.002 (2.378)	0.002 (1.696)	-0.005 (0.148)	2.629 [a] (4.772)
Los Angeles	-0.022 (1.319)	-0.150 (1.052)	-0.114 (0.905)	1.715 (1.418)	-0.004 (1.584)	-0.020 (1.437)	-0.015 (1.187)	-1.230 [a] (1.459)
Stanislaus	---	0.057 (1.297)	---	0.005 (0.003)	---	0.007 (1.495)	---	3.788 (0.928)
Riverside	0.040 (0.238)	-0.208 (1.202)	-0.363 (2.502)	0.324 (0.151)	-0.002 (0.419)	-0.001 (0.129)	-0.007 (0.160)	-1.121 (0.931)
San Bernardino	-0.021 (0.238)	-0.181 (1.586)	-0.192 (2.071)	5.361 (2.190)	0.012 (1.595)	0.014 (1.974)	-0.058 (2.067)	2.641 (1.417)
Tulare	---	---	---	2.376 (1.720)	---	---	---	0.705 (0.675)

For each model, n=48 and includes a post carve-out indicator (0,1) and 3 year and 3 season dummies. The t statistics use White-corrected standard errors. Several counties have only Commercial Plan(s) or Local Initiative plans; Tulare County did not implement Medi-Cal managed care during the study period.
(1) Model without PHP enrollment variable (for counties that had PHP contracts)
(2) Model includes PHP enrollment variable
[a] Can reject ln_s_enr=1, $p<0.05$

significant effect (at $p<0.10$) of managed care participation. The counties in which the carve-out effect variable was positive and statistically significant at the five percent level for the mandatory group were Kern and Fresno. Other counties with positive coefficients at the ten percent level were Alameda, Contra Costa, San Francisco, Santa Clara, and San Bernardino. The coefficient was negative but not significant for Los Angeles County.

A question is whether counties without a significant carve-out effect are those that did not implement default during the study period. Results were consistent with this hypothesis. Only one county of the 11 counties that implemented default MCP enrollment by early 1997 had a coefficient for the mandatory group that was not significant at $p<0.10$ (Stanislaus, at $p<0.12$). Similarly of the five (5) counties with no effect or with a negative coefficient, only one (San Joaquin) had implemented default by early 1997 and had reached greater than 50 percent managed care participation in the mandatory group by the end of the study period (as illustrated in **Figure 3.8**). This is consistent the earlier finding that the effect of MCP participation reached a substantial magnitude only at the higher participation levels achieved in the post default period. It is difficult to discern how much of the differences are due to the voluntary nature of participation prior to default; to the lower absolute levels of participation; or to a combination of these characteristics, because they are confounded.

A more comprehensive, qualitative implementation analysis would be needed to fully understand reasons for differences in carve-out impact across counties, if these differences are not attributable to chance (given the limited number of observations for each county). However, it is possible to evaluate whether the county-specific findings are consistent with some plausible explanations. It is possible that there was particular impact in the counties that had not had Medi-Cal managed care prior to the simultaneous carve-out expansions. For the three counties that had no Medi-Cal managed care (i.e., "CCS-include" PHP participation) prior to the CCS carve-out, coefficients for the carve-out variable were positive and statistically significant for two of the three (Kern and Fresno) and approached significance for the third (Stanislaus, $p=0.14$). Comparison of post-default interaction terms from models with a main effect for the post period and a post default indicator (data not shown) showed large coefficients for these counties although not precisely estimated as 0.26 (95 percent CI of (0.05, 0.47)) for Kern; 0.45 (95 percent confidence interval of (0.17, 0.72) for Fresno; and 0.48 (95 percent confidence interval of (-0.16, 1.11) for Stanislaus. As noted earlier, not only the absolute levels of participation but also the length of time taken to reach high participation levels may contribute to the differences.

Prepaid health plans operated "CCS-include" contracts in the other eight (8)Two Plan counties that implemented managed care by the end of 1997. While any PHP effect is unlikely to be precisely estimated in these models, the coefficients and their signs were evaluated. Of these eight counties, the coefficient for PHP participation was statistically significant for only one county (San Francisco) and was positive. In the other seven counties, there was no association between PHP participation and monthly CCS claimant volume.

As noted earlier, the PHP participation variable was included in multivariate models of claimant volume change so that the carve-out effect variable would not include the effect of changing CCS

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caseload composition due to PHP disenrollment. Model 1 in **Table 5.10** shows the impact on the managed care coefficient of excluding the PHP variable. For the mandatory group, excluding the PHP variable generally did not cause the MCP coefficient to increase as might be expected had PHP disenrollment resulted in more claimants after the carve-out. With respect to sensitivity of the MCP coefficient to inclusion of the PHP variable, the standard errors for the MCP coefficient dropped for several counties (Alameda, Contra Costa, Santa Clara). Among the Two Plan counties, two counties that fully implemented the carve-out during the study period (Contra Costa County and Los Angeles County), and two counties that did not have both plans operating by the end of 1997 (San Bernardino and San Francisco), had substantial PHP participation among beneficiaries in the mandatory group. For Contra Costa, the MCP coefficient did not change, but the standard error was smaller causing the coefficient to become statistically significant. In San Francisco, the coefficient dropped from 0.013 to 0.001. The overall finding for the mandatory group in the county-specific models was similar to the finding when counties were combined, which is that a PHP effect could not be substantiated although ignoring PHP enrollment might tend to overestimate the carve-out impact attributable to the new incentive.

Non-mandatory managed care group

Results were somewhat different for the non-mandatory group. In this group, as shown in **Table 5.7**, the rate of MCP participation was low; it exceeded 10 percent by the end of the study period for only one county (San Joaquin) (illustrated in **Figure 4.4**). The non-mandatory group combining Two Plan counties showed a significant effect (**Table 5.8**). The carve-out effect was not significant for any individual county using the percent participation variable (Model 2, **Table 5.10**). This is likely due to the small effect sizes and to the lack of precision in these estimates. For Alameda County, excluding the PHP variable caused the standard error of the MCP coefficient to decline, thus producing a significant, positive effect. This was the exception, however. These findings provide little insight into variation of effect for the carve-out and for the covariates at the county level.

Combined Two Plan and Non-Expansion Counties

Comparison of expansion and non-expansion counties was undertaken to compare monthly CCS volume trends during the pre and post carve-out periods in managed care expansion counties with CCS claimant volume in the non-expansion counties. In the non-expansion counties, managed care participation in the carve-out health plans is zero throughout the study period.[65] **Table 5.11, Regression results for CCS claimants—Two Plan and non-expansion counties**, provides results for the mandatory and the non-mandatory managed care groups for twelve (12) Two Plan model and non-expansion counties. Comparison groups are the eight (8) non-expansion counties with

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[65] Several non-expansion counties had voluntary "CCS-include" PHP participation throughout the study period. As discussed in Chapter 3, the carve-out policy did eventually extend to PHP contracts. CCS services were not excluded from those contracts until very late in the study period or after the study period. Thus in the multivariate model, the PHP variable picks up pre carve-out "CCS-include" PHP effects in the expansion counties. It also picks up the effects of PHP participation for those non-expansion counties that had a small amount of participation in the pre and post carve-out periods.

Table 5.11 – Regression results for CCS claimants—Two plan and non-expansion counties (coefficients and absolute t statistics)

Variable	Dependent variable=log(claimant volume)							
	Two Plan and non-expansion independent CCS counties (n=20)				Two Plan, non-expansion independent CCS counties, matched urban-rural score (n=23)			
	Non-mandatory aidcodes		Mandatory aidcodes		Non-mandatory aidcodes		Mandatory aidcodes	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Percent MCP (pct2cpli)	0.024 (5.565)	---	0.058 (4.422)	---	0.020 (3.676)	---	0.005 (3.552)	---
Post carve-out (post)	-0.066 (1.838)	---	-0.113 (2.141)	---	-0.078 (2.095)	---	-0.151 (2.400)	---
Post carve-out, no default (post1_a)	---	-0.012 (0.311)	---	-0.015 (0.353)	---	-0.032 (0.800)	---	-0.060 (0.997)
Post default (post2_a)	---	0.064 (1.405)	---	0.300 (3.445)	---	0.028 (0.576)	---	0.209 (1.773)
log Medi-Cal enrolled (ln_s_enr)	1.192 (2.052)	1.308 (2.128)	1.690 [a] (6.501)	1.623 [a] (6.414)	1.384 (2.330)	1.465 (2.386)	1.140 (2.167)	1.086 (2.085)
Percent PHP (pct2_php)	0.038 (3.654)	0.031 (2.929)	-0.002 (0.326)	0.001 (0.147)	0.027 (2.025)	0.022 (1.843)	-0.002 (0.514)	-0.000 (0.075)
1995	0.111 (2.623)	0.107 (2.535)	0.111 (2.502)	0.109 (2.400)	0.110 (2.851)	0.108 (2.777)	0.077 (1.752)	0.076 (1.716)
1996	0.150 (2.732)	0.141 (2.521)	0.123 (3.393)	0.115 (2.900)	0.150 (2.785)	0.143 (2.618)	0.124 (3.324)	0.118 (2.944)
1997	0.273 (4.857)	0.272 (4.781)	0.280 (4.709)	0.285 (4.751)	0.295 (5.174)	0.294 (5.078)	0.302 (4.798)	0.305 (4.841)
N	960	960	960	960	1,104	1,104	1,104	1,104
R squared	0.98	0.98	0.97	0.97	0.99	0.99	0.97	0.97

Each model includes county fixed effects and 3 season variables; the omitted county is Tulare County, the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.

    (1) Post indicator for carve-out period and continuous MCP variable

    (2) Post indicators for carve-out period prior to default, and post default.

[a] Can reject hypothesis that ln_s_enr = 1, $p < 0.05$

independent CCS programs, and the eleven (11) non-expansion counties with independent CCS programs and/or a urban-rural score matched to the expansion counties.

Results for the pre-post comparison and for the continuous MCP specification are provided in **Table 5.11**. Findings for these models were generally similar to results when limited to Two Plan expansion

counties. No post carve-out effect was found for the mandatory group during the pre-default period, and the impact was concentrated in the post default period as in earlier findings. Comparison with only the 8 independent CCS program counties suggested approximately a 35 percent increase, and the effect was smaller (23 percent) when compared with the larger group of 11 non-expansion counties. For the mandatory managed care group, the coefficients for managed care participation were positive and significant. Coefficients for the year dummies were comparable for the different combinations of counties.

For the non-mandatory managed care group, the coefficient for the post default period indicator did not differ from zero using either comparison group. The coefficient fell from 0.099 with only Two Plan counties to 0.064, p=0.18 (adding independent CCS counties) and to 0.028, p=0.58 (adding counties matched by urban-rural scores). The MCP participation variable suggested a significant, positive trend in claimant volume with increasing managed care participation, using the 8 as well as using the 11 non-expansion counties as comparisons. Year dummies were comparable in magnitude across the three models.

Overall, the specifications with Two Plan and non-expansion counties shows a significant claimant increase with the carve-out for the mandatory group. The findings for the mandatory group suggest that some of the change in CCS claimant volume attributed to the carve-out policy in the Two Plan model specification may be attributable to CCS program changes that occurred in similar California counties. The post default claimant volume increase of 42 percent estimated among Two Plan counties fell to 35 percent when 8 comparison counties were included, and to 23 percent when 11 comparison counties were included. However, the effect for the non-mandatory group diminished and did not reach statistical significance when Two Plan and non-expansion counties were combined.. Thus some of the change to claimant volume in the non-mandatory group would appear to be part of a statewide trend—such as Medi-Cal field office changes across counties, or other exogenous changes—rather than due to increasing MCP participation.

5.2.2   Claimant Volume for COHS Counties

The findings in COHS counties focus on the mandatory managed care group, due to the relatively small size of the non-mandatory group in those counties. It is important to note in comparing results for COHS and Two Plan counties that the mandatory group in the COHS counties includes many of the aid eligibility categories that confer voluntary participation in the Two Plan counties. This includes SSI beneficiaries, among others.

Results for the two COHS expansion counties are provided in **Table 5.12, Regression results for CCS claimants—Combined COHS and non-expansion counties, mandatory managed care group**. A post carve-out indicator was not significant and had a negative sign in a model limited to the two expansion COHS counties. It is difficult to identify the carve-out effect with the 1996 and 1997 dummy variables in the model because only three observations (months) for Orange took place in 1995, and Santa Cruz implemented in the first month of 1996. A post default indicator was not used in the COHS specifications because participation was phased in by aid category in Orange

Table 5.12 – Regression results for CCS claimants – Expansion COHS and non-expansion counties, mandatory group (coefficients and absolute t statistics)

Variable	Dependent variable=log(claimant volume)					
	COHS expansion counties (n=2)		COHS and non-expansion independent CCS counties (n=10)		COHS, non-expansion independent CCS counties, matched urban-rural score (n=13)	
	(1)	(2)	(1)	(2)	(1)	(2)
Percent MCP (pct2cohs)	---	0.008 (15.248)	---	0.004 (12.993)	---	0.003 (2.949)
Post carve-out (post)	-0.079 (0.911)	-0.077 (0.855)	0.290 (2.948)	-0.042 (1.318)	0.240 (2.771)	-0.014 (0.499)
log Medi-Cal enrolled (ln_s_enr)	2.509 (5.515)	2.522 (5.571)	1.399 (3.978)	1.526 (4.338)	0.508 (0.786)	0.597 (0.882)
Percent PHP (pct2_php)	0.000 (0.869)	-0.000 (0.840)	-0.007 (1.390)	0.001 (0.977)	-0.002 (0.777)	0.001 (0.504)
1995	0.102 (1.509)	0.101 (1.478)	0.130 (2.798)	0.136 (2.977)	0.134 (3.626)	0.137 (3.785)
1996	0.639 (4.532)	-0.125 (1.393)	0.215 (4.264)	0.207 (4.030)	0.253 (4.588)	0.244 (4.227)
1997	0.942 (6.047)	0.171 (1.549)	0.387 (8.015)	0.386 (7.916)	0.413 (7.638)	0.411 (7.440)
N	96	96	480	480	624	624
R squared	0.99	0.99	0.98	0.98	0.98	0.98

Each model includes county fixed effects and 3 season variables; the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed. Cannot reject hypothesis that ln_s_enr = 1, $p<0.05$ for any of the models.
(1) Post indicator for carve-out period
(2) Post indicator for carve-out period and continuous MCP variable

County. Default became operational for different aid categories pooled in these analyses over approximately a five month period. Thus unlike the Two Plan counties, Orange County did not have a single month at which default began. (The default was immediate for all mandatory aid categories in Santa Cruz).

Most results for other specifications were similar to the findings from combining observations from Two Plan and non-expansion counties. The coefficient for managed care participation was statistically significant at 0.008 (Model 2). Given the timing of the two COHS county expansions, however, the fact that the 1996 and 1997 year dummies do not differ from zero suggests that the

MCP variable may be picking up part of a general time trend. Thus it is important to compare COHS trends with non-expansion counties. The post indicator using the 11 comparison counties suggested a significant, 27 percent post carve-out increase in claimant volume. This is roughly equivalent to the increase suggested by the continuous variable, where a one percent increase in managed care participation leads to a 0.3 percent increase in claimant volume (Model 1). Estimates of carve-out impact were higher when the 8 independent CCS program counties comprised the comparison group, suggesting a 34 percent increase (with the post indicator model) or a 40 percent increase at full implementation (using the continuous variable).

PHP participation in Orange County was close to 14 percent of all Medi-Cal beneficiaries in the county for 1994 and 1995, when the COHS was not yet operational. There was no effect of PHP participation on claimant volume, and removing this variable from the specification had no effect on the other variables in the model. Thus disenrollment of beneficiaries from these PHPs as the COHS began operation appeared not to concomitantly increase the volume of CCS claimants. As with the Two Plan counties, a specification limited to the COHS expansion counties showed a larger effect than that indicated when combined with the non-expansion counties, due to the substantial independent time trend.

In summary, claimant volume increased in the COHS expansion counties just as in the Two Plan counties. Unlike the Two Plan counties, the COHS counties had effect measures with significance levels lower than 5 percent when combined with non-expansion counties. For both Two Plan and COHS expansion counties, an independent time trend on increasing claimant volume was indicated.

5.2.3 Summary of Findings

The implications of these findings can be summarized in the following way. Mean monthly claimant volume was found to increase between pre and post carve-out periods for the mandatory and non-mandatory groups, but estimating separate effects for the pre and post default periods was necessary to detect a significant effect using post indicators. Claimant volume increased with MCP participation in Two Plan and COHS expansion counties although for the Two Plan counties, the slope in the pre default period (which was not significant) differed from the slope in the default period where the effect appeared to be concentrated. In the Two Plan counties, the effect was larger for the mandatory group than for the non-mandatory group. The carve-out effect also was larger in the COHS counties' mandatory group than in the Two Plan counties (although these groups differ in composition and are not directly comparable).

If the mechanism for carve-out impact is referral practice changes on the part of providers—which may interact with incremental changes to CCS authorization practices—then increased rates of MCP participation among the mandatory managed care group may drive change within a county. If Medi-Cal field office changes in authorization practices played a significant role, then the carve-out effect may have taken place as a level shift that is captured by a pre-post indicator, and in part by the time trend year dummies. While results of these models do not distinguish these effects, they demonstrate

increased claimant volume when managed care was fully operational in a county, and they also show increasing volume associated with increased managed care penetration.

5.3 Carve-out Impact on Claimant Volume In Selected Medi-Cal Eligibility Aid Categories

Analyses that pool the many aid eligibility categories do not distinguish between changes occurring within different aid categories, yet there is likely to be heterogeneity in beneficiary composition across some of these categories. The following analyses evaluate trends in CCS claimant volume for three Medi-Cal eligibility aid categories. These aid categories were selected due to their different composition; varied managed care requirements status across expansion counties; and relative size to permit precise estimates of carve-out impact. They include: (1) aid category 30, which confers Medi-Cal eligibility to all cash aid (public assistance) recipients; (2) aid category 34, which confers Medi-Cal eligibility based on family income to those whose income does not qualify them for cash aid; and (3) aid category 60, which confers Medi-Cal eligibility to an individual based on Supplemental Security Income (SSI) recipient status. Of all CCS claimants between 1994 and 1997, 22.8 percent were in aid category 30, 20.4 percent were in aid category 60, and 10.6 percent were in aid category 34. These aid categories combined thus represent 53.8 percent of CCS claimants during the study period. Equivalent managed care requirements for aid categories 30 and 34 across Two Plan and COHS expansion counties permit a model that combines counties for estimating overall carve-out impact. In contrast, the differing managed care requirements between COHS and Two Plan counties for aid category 60 permit investigation of carve-out impact under these different environments.

Hypotheses and Rationale for Aid Category Selection

Medi-Cal aid category 30 is the largest category for mothers and children receiving AFDC cash assistance. It has become a category within the post 1996 welfare reform "1931(b)" category that combines CalWORKs and non-CalWORKs participants who meet pre welfare reform AFDC cash assistance criteria. This category included an average of 1.9 million enrollees monthly in calendar year 1996, comprising 54.7 percent of mandatory eligibles and 35.4 percent of total Medi-Cal beneficiaries. In aid category 30, several effects on total Medi-Cal enrollment were expected based on economic changes taking place during the study period. Improvement in economic conditions in the State resulted in fewer cash assistance recipients during the later years of the study period. In addition, dips in enrollment might be expected to occur during 1997 due to the impact of the 1996 welfare reform legislation (CalWORKs in California). This imposes work requirements and cash assistance limits on recipients of AFDC/TANF. Though these provisions were not implemented in California's counties until January 1998 (Klerman 1999), anticipated loss of benefits may have encouraged some recipients to seek work and to end their public assistance. This could cause loss of Medi-Cal or a change in a child's Medi-Cal eligibility aid designation (e.g., from AFDC cash assistance to a low-income family category). Due to these trends, CCS claimants could increase as a proportion of Medi-Cal beneficiaries. CCS claimants also could drop in total number during the

later years of the study period, given that fewer families (the base population from which children with CCS eligible diagnoses are identified) were receiving Medi-Cal benefits at that time.

Medi-Cal aid category 34 is part of California's Medically Needy program, which is an optional Medicaid program for states that extends coverage to those with disability or income deprivation requirements whose income is too high to qualify for cash assistance. This category included an average of 429,142 enrollees monthly in calendar year 1996, comprising 12.2 percent of mandatory eligibles and 7.9 percent of total Medi-Cal beneficiaries. Medi-Cal eligibility is extended through aid category 34 to children and families who are not eligible for AFDC or SSI cash assistance or who choose not to receive cash assistance. As for aid category 30, improved economic conditions in the State resulted in fewer families with household incomes that qualified them for Medi-Cal benefits through this aid category.

Aid category 60 denotes Medi-Cal eligibility linked to SSI income. It included an average of 714,175 enrollees monthly in calendar year 1996, comprising 37.5 percent of mandatory eligibles and 13.2 percent of total Medi-Cal beneficiaries. In aid category 60, changes to childhood eligibility for SSI benefits may have affected enrollment in several ways. First, during the years 1994 and 1995, children's participation in SSI was increasing statewide. This is attributed to childhood eligibility regulations put forth following a 1993 Supreme Court decision (Sullivan v. Zebley). Growth in the caseload was likely to be smaller in magnitude among children with medical diagnoses that are CCS qualifying. Improved economic conditions in the state could have resulted in a number of children losing SSI eligibility as their parent(s) found work or increased working hours with resulting household income that exceeded SSI standards. Overall, trends in this aid category include an increasing trend in SSI-linked Medi-Cal through 1995 and apparent declines in the later study period. Enrollment in other members of the SSI eligibility group—alien/non-citizens in particular—may have declined at a faster rate than for children. Consequently, CCS claimants might increase as a proportion of all Medi-Cal recipients in this aid category.

Figure 5.4, Total monthly Medi-Cal beneficiaries and CCS claimants in aid category 30 (cash assistance), with PHP and MCP participation rates—Two Plan and COHS expansion counties, 1994-1997, shows Medi-Cal enrollment volume over the study period in aid category 30. **Figure 5.5** and **Figure 5.6** show trends for aid categories 34 and 60, respectively, and combine the 12 Two Plan counties and the 2 COHS expansion counties. These figures illustrate declines in aid category 30 through 1996 and 1997. A cyclical pattern with some decline is apparent for aid category 34. For the SSI aid category, an increasing trend that levels off for 1996 and 1997 is evident. Trends in CCS claimant volume, in CCS-include PHP participation, and in MCP participation also are provided so that the Medi-Cal trends can be juxtaposed with the timing of the managed care expansion and CCS claimant trends. (These expansion county MCP percentages are weighted by county volume.)

MCP participation rates also varied by aid category. As illustrated in **Figure 5.4**, over 50 percent of aid category 30 beneficiaries in COHS and Two Plan counties were participants in managed care by the end of the study period. Participation in managed care was lower in aid category 34, reaching

Figure 5.4 – Total monthly Medi-Cal beneficiaries and CCS claimants in aid category 30 (cash assistance), with PHP and MCP participation rates—Two Plan and COHS expansion counties, 1994-1997
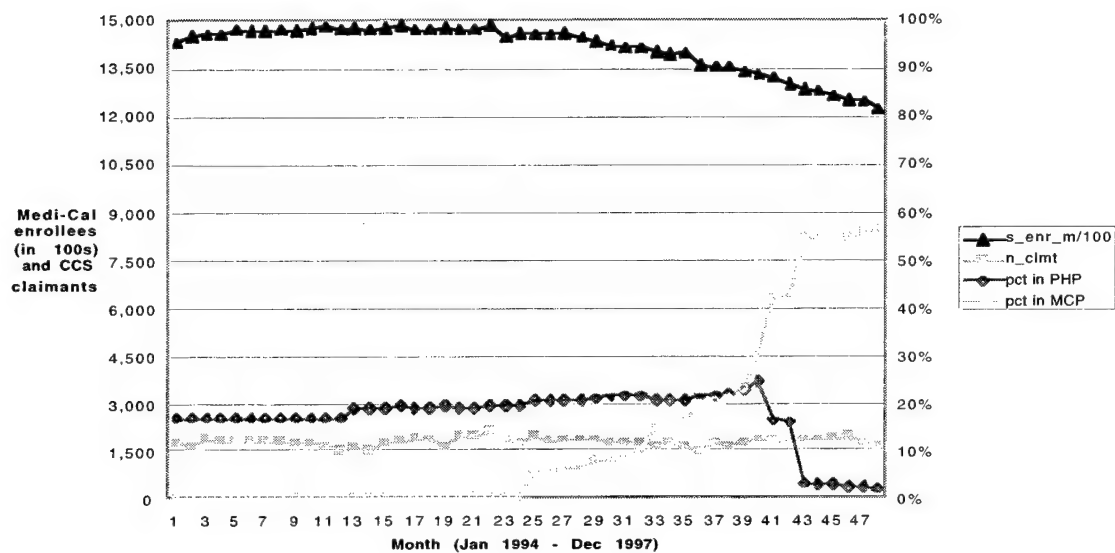
Figure 5.5 – Total monthly Medi-Cal beneficiaries and CCS claimants in aid category 34 (cash assistance), with PHP and MCP participation rates—Two Plan and COHS expansion counties, 1994-1997

Month (Jan 1994 - Dec 1997)

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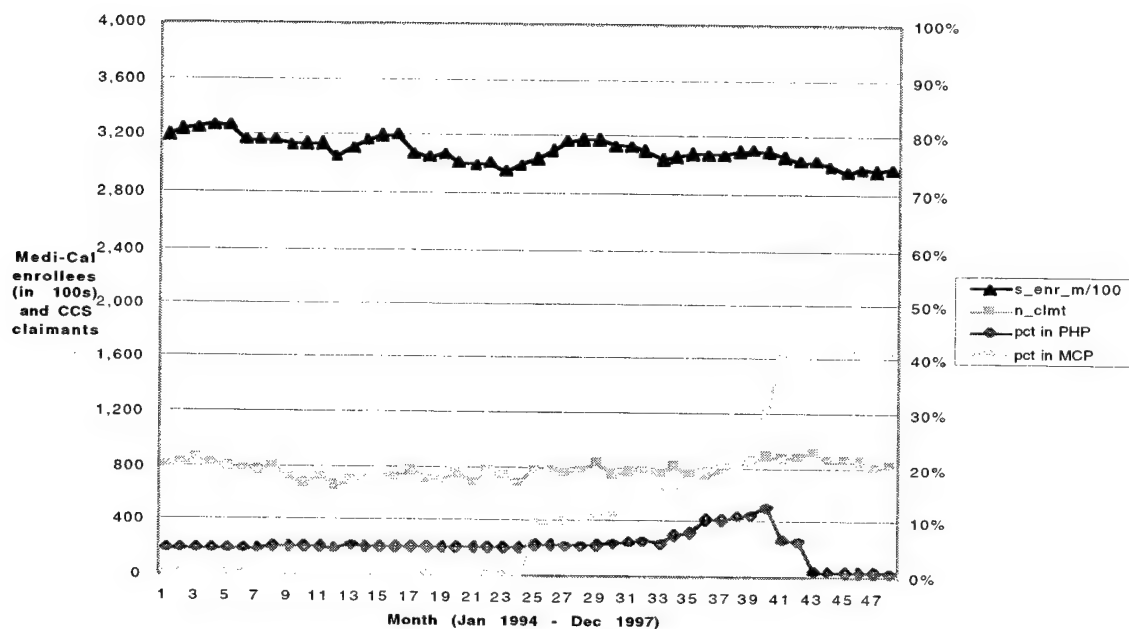
Figure 5.6 – Total monthly Medi-Cal beneficiaries and CCS claimants in aid category 60 (cash assistance), with PHP and MCP participation rates—Two Plan and COHS expansion counties, 1994-1997
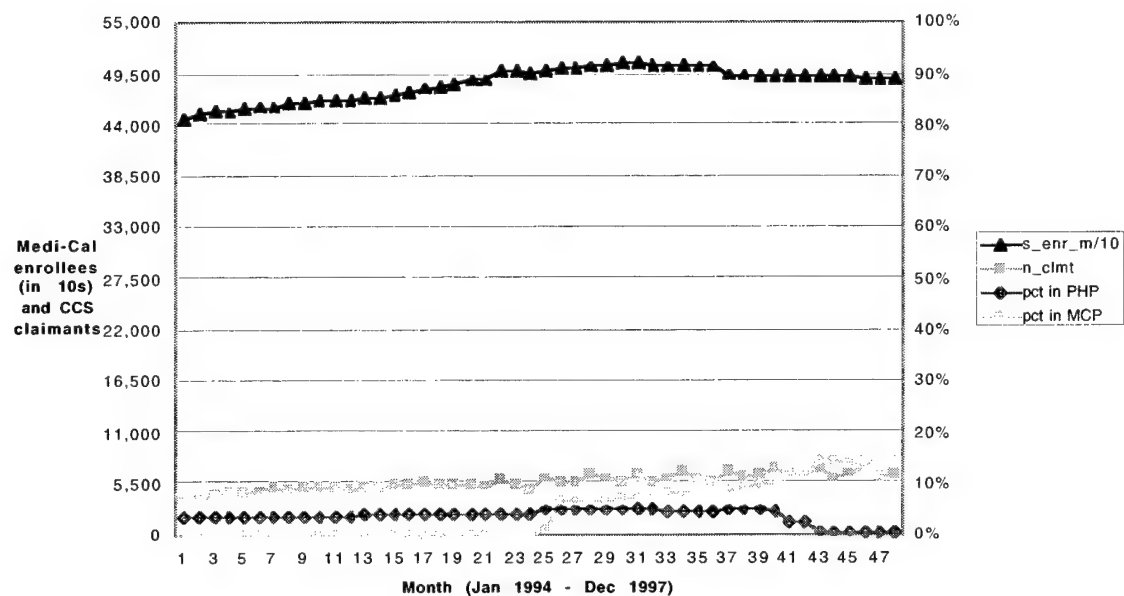
over 40 percent by the end of the study period (**Figure 5.5**). MCP participation rates for the SSI aid category reached 10 percent across the expansion counties largely due to high participation in COHS counties, with minimal participation (up to approximately 5 percent) in the Two Plan counties (**Figure 5.6**).

Findings for Claimant Volume by Aid Category

The multivariate analysis of the carve-out effect by aid category evaluated impact in 12 Two Plan model counties, the 2 expansion COHS counties, and changes relative to non-expansion counties. Specifications included comparison of pre and post carve-out claimant volume as well as use of a continuous MCP participation variable. The 11 non-expansion counties that had independent CCS programs or matched the expansion counties on urban-rural characteristics comprised the comparison counties used in these analyses.

Aid categories with mandatory status in all expansion counties

The findings for the multivariate pre and post carve-out comparison are provided in **Table 5.13, Pre and post carve-out CCS claimant volume for two mandatory managed care Medi-Cal aid categories**. This table provides results for two of the Medi-Cal eligibility aid categories (30 and 34) that confer mandatory managed care enrollment status in all of the managed care expansion counties. Results are presented for (1) all counties (Two Plan model, COHS, and non-expansion counties); (2) for the Two Plan and expansion counties; (3) for the Two Plan and COHS counties combined; (4) for the Two Plan counties; and (5) for the COHS counties.

There was a post carve-out increase in claimants in aid category 30 for the COHS counties (39 percent) and a smaller, nonsignificant increase for the Two Plan counties. For the non cash-assistance aid category 34, the effect in the COHS counties is statistically significant (39 percent) while the effect in the Two Plan model counties (7 percent) is not[66].. As in COHS models that pooled mandatory aid categories, the post carve-out indicator appeared to capture any carve-out effect in addition to the time trends; none of the year dummies differed from zero. Combining the Two Plan and COHS counties produces an overall estimate for the carve-out across expansion counties of a 17 percent claimant increase for aid category 30 and a 9 percent (not significant) claimant increase for aid category 34 (Model 3). **Table 5.14, Mean percentages for managed care regression variables, by aid categories—Expansion and non-expansion counties**, shows that managed care penetration was higher in Two Plan counties among aid category 30 beneficiaries (mean of 15.5 percent for the 48 study period months, and 50.9 percent for the post carve-out months) than in aid category 34 (with means of 12.0 and 39.4, respectively). In contrast, participation was approximately 100 percent in COHS county post carve-out months. This may explain the relative carve-out impact.

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[66] The effect for the post dummy variables is $e^{\beta}-1$.

Table 5.13 – Pre and post carve-out CCS claimant volume for two mandatory managed care Medi-Cal aid categories (coefficients and absolute t statistics)

	Aid categories									
Variable	30 (cash assistance)					34 (no cash assistance)				
Model	2 plan	COHS	2 plan, COHS	2 plan, COHS, & 11	2 plan & 11	2 plan	COHS	2 plan, COHS	2 plan, COHS, & 11	2 plan & 11
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Indicator for post carve-out (post1)	0.123 (1.703)	0.334 (4.786)	0.156 (2.184)	0.152 (1.858)	—	0.030 (0.600)	0.328 (3.796)	0.087 (1.480)	0.067 (0.772)	—
Indicator for post, no default (post1_a)	—	—	—	—	-0.040 (0.683)	—	—	—	—	-0.085 (1.433)
Indicator for post default (post2_a)	—	—	—	—	0.280 (2.335)	—	—	—	—	0.138 (1.239)
log Medi-Cal enrolled	1.140 (2.554)	0.397 (0.597)	1.162 (2.607)	0.785 (2.004)	0.903 (2.253)	1.103 (4.143)	0.766 (2.663)	0.816 (3.010)	0.833 (4.515)	0.964 (5.224)
Percent PHP ("CCS-include")	0.000 (0.048)	-0.011 (2.330)	-0.004 (0.728)	-0.002 (0.488)	0.006 (1.310)	-0.017 (1.621)	0.002 (0.292)	-0.021 (1.867)	-0.018 (1.992)	-0.008 (0.976)
1995	0.098 (1.319)	-0.076 (0.815)	0.078 (1.202)	0.087 (1.689)	0.094 (1.674)	0.091 (1.165)	-0.085 (0.739)	0.068 (0.983)	0.032 (0.589)	0.037 (0.645)
1996	0.027 (0.412)	-0.083 (0.476)	0.064 (1.130)	0.056 (0.940)	0.044 (0.677)	0.099 (1.970)	0.144 (1.215)	0.128 (2.855)	0.104 (2.102)	0.083 (1.738)
1997	0.253 (1.899)	-0.025 (0.101)	0.246 (1.969)	0.200 (2.331)	0.196 (2.300)	0.307 (5.427)	0.275 (2.445)	0.303 (6.702)	0.315 (3.932)	0.282 (3.252)
N	576	144	672	1,200	1,104	576	144	672	1,200	1,104
R squared	0.93	0.94	0.93	0.95	0.95	0.93	0.94	0.93	0.92	0.92

(1) Model includes the 12 Two-Plan counties, N=576 (12 counties) with fixed county effects.
(2) Model includes the expansion COHS counties (Orange and Santa Cruz) and referent Tulare, N=144 (3 counties) with fixed county effects.
(3) Model includes the 12 Two-Plan counties and Orange and Santa Cruz COHS counties, N=672 (14 counties) with fixed county effects.
(4) Model includes the 12 Two-Plan counties, Orange and Santa Cruz COHS counties, and the non-expansion counties, N=1,200 (25 counties) with fixed county effects.
(5) Model includes the 12 Two-Plan counties and 11 non-expansion counties, N=1,104 with fixed county effects.
Each model includes fixed county effects and 3 season dummies, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed. Aid categories 30 and 34 confer mandatory managed care status in all expansion counties. The hypothesis that ln_s_enr = 1, $p < 0.05$ was not rejected for any model.

Table 5.14 – Mean percentages for managed care regression variables, by aid category—Expansion and non-expansion counties

Variable	Mean monthly percentage					
	Expansion counties [a]		Expansion and 8 non-expansion independent CCS counties [b]		Expansion & 11 non-expansion independent CCS counties, matched urban-rural [c]	
	Mean (s.d.)	N	Mean (s.d.)	N	Mean (s.d.)	N
Aid category 30						
% MCP, Two Plan	15.47 (29.21)	(N=576)	9.28 (23.85)	(N=960)	8.07 (22.46)	(N=1,104)
Two Plan, post	50.92 (31.69)	(N=175)				
Two Plan, post carve-out & no default	23.65 (18.63)	(N=76)				
Two Plan, post carve-out & default	71.86 (22.31)	(N=99)				
% MCP, COHS	50.00 (50.26)	(N=96)	10.00 (30.03)	(N=480)	7.69 (26.65)	(N=624)
% PHP, Two Plan	7.52 (11.06)	(N=576)	4.71 (9.27)	(N=960)	4.37 (8.92)	(N=1,104)
% PHP, COHS	5.98 (10.40)	(N=96)	1.60 (5.26)	(N=480)	1.70 (5.36)	(N=624)
Aid category 34						
% MCP, Two Plan	11.98 (29.21)	(N=576)	7.19 (18.56)	(N=960)	6.25 (17.48)	(N=1,104)
Two Plan, post	39.44 (24.90)	(N=175)				
Two Plan, post carve-out & no default	17.78 (14.06)	(N=76)				
Two Plan, post carve-out & default	56.06 (17.51)	(N=99)				
% MCP, COHS	49.96 (50.22)	(N=96)	9.99 (30.01)	(N=480)	77.69 (26.65)	(N=624)
% PHP, Two Plan	2.69 (4.07)	(N=576)	1.68 (3.40)	(N=960)	1.57 (3.29)	(N=1,104)
% PHP, COHS	1.49 (2.60)	(N=96)	0.44 (1.34)	(N=480)	0.53 (1.63)	(N=624)
Aid category 60						
% MCP, Two Plan	1.86 (3.45)	(N=576)	1.11 (2.82)	(N=960)	0.97 (2.66)	(N=1,104)
Two Plan, post carve-out	6.11 (3.63)	(N=175)				
Two Plan, post carve-out & no default	3.40 (2.46)	(N=76)				
Two Plan, post carve-out & default	8.20 (2.94)	(N=99)				
% MCP, COHS	48.93 (50.20)	(N=96)	9.79 (29.72)	(N=480)	7.53 (26.39)	(N=624)
% PHP, Two Plan	2.06 (2.80)	(N=576)	1.32 (2.38)	(N=960)	1.23 (2.31)	(N=1,104)
% PHP, COHS	1.12 (1.89)	(N=96)	0.39 (1.05)	(N=480)	0.44 (1.21)	(N=624)

N in each cell refers to total county-months contributing to the measure.
[a] N=576 (12 Two Plan counties) and N=96 (2 COHS counties)
[b] N=960 (12 Two Plan counties & 8 expansion) and N=480 (2 COHS counties & 8 expansion)
[c] N=1,104 (12 Two Plan counties & 11 expansion) and N=624 (2 COHS counties & 11 expansion)

The results for the Post indicator in Model 4 show the increase in CCS claimants in the post carve-out months in expansion counties relative to non-expansion counties and to pre carve-out months in expansion counties. The results suggest an increase in CCS claimant volume associated with the post carve-out period that is marginally significant for aid category 30. Model (5) shows that the expansion counties combined with the non-expansion counties indicate an effect in the post default period only. No increase was found for aid category 34.

The findings for the continuous participation specification are summarized in **Table 5.15, Regression results for CCS claimants for three Medi-Cal aid categories**. For aid categories 30 and 34, the two specifications illustrated are for the Two Plan model and non-expansion counties combined, and for the Two Plan model, COHS, and non-expansion counties combined. It is not appropriate to combine Two Plan and COHS counties for aid category 60 because this aid category confers mandatory managed care status in COHS counties but confers non-mandatory status in Two Plan model counties. Results for aid category 60 are discussed in the next section.

As illustrated in **Table 5.15**, the coefficient representing the carve-out effect was in the expected direction and significant for aid category 30 (coefficient of 0.005) and for aid category 34 (coefficient of 0.005) in the model that combined Two Plan and non-expansion counties. Adding the two expansion COHS counties (Orange and Santa Cruz) to the model caused the standard error to drop for the MCP coefficients for both aid categories. Thus claimant volume increased with higher MCP participation within each aid category.

Aid category with different managed care requirements across expansion counties

Aid category 60 (SSI) is the largest Medi-Cal eligibility aid category that confers mandatory managed care enrollment status in COHS counties but not in Two Plan model counties. Findings using the pre-post indicator are provided in **Table 5.16, Pre and post carve-out CCS claimant volume for aid category 60 (SSI)**. Results are presented for Two Plan model counties (Model 1); for the Two Plan model and non-expansion counties combined (Models 2 and 3); for the COHS counties only (Model 4); and for the COHS and non-expansion counties combined (Model 5).

The post carve-out indicator showed no increase in CCS claimants in the post carve-out months in the Two Plan model expansion counties. When the non-expansion counties were added to the specification, the coefficient remained insignificant and was smaller in magnitude (Model 2). There was no apparent increase in claimant volume even in the post default period, in the Two Plan counties (Model 3). In contrast, a 22 percent increase in monthly claimant volume was found for the SSI aid category in the counties where it conferred mandatory managed care participation (Model 4). This effect held when COHS and non-expansion counties were combined. Because the managed care requirement was imposed for SSI beneficiaries several months after initial implementation (in Orange County), it is possible to evaluate impact during the initial phase and during the post default phase for this aid category. For the COHS counties, distinguishing between the initial and post default periods after the carve-out suggests that the effect was concentrated in

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Table 5.15 – Regression results for CCS claimants for three (3) Medi-Cal aid categories (coefficients and absolute t statistics)

Variable	OLS for log(claimants)					
Aid category	30 (cash assistance)		34 (no cash assistance)		60 (SSI)	
Counties	Two Plan & 11 non-expansion (1)	Two Plan, COHS & 11 non-expansion (2)	Two Plan & 11 non-expansion (1)	Two Plan, COHS, & 11 non-expansion (2)	Two Plan & 11 non-expansion (1)	COHS & 11 non-expansion (3)
Percent MCP participation	0.005 (3.162)	0.006 (4.792)	0.005 (2.916)	0.005 (5.169)	0.019 (3.010)	0.002 (1.613)
Indicator for post carve-out	-0.113 (1.620)	-0.119 (1.841)	-0.150 (2.161)	-0.146 (2.051)	-0.086 (1.382)	0.060 (0.926)
log Medi-Cal enrolled	0.899 (2.250)	0.942 (2.499)	0.942 (5.034)	0.921 (5.244)	1.592 (3.391)	2.412[a] (4.087)
Percent PHP ("CCS-include")	0.004 (1.170)	0.002 (0.691)	-0.012 (1.671)	-0.010 (1.551)	0.025 (2.720)	0.013 (1.790)
1995	0.096 (1.722)	0.083 (1.607)	0.039 (0.673)	0.030 (0.561)	0.108 (2.722)	0.118 (2.161)
1996	0.048 (0.753)	0.051 (0.866)	0.088 (1.899)	0.085 (1.800)	0.133 (2.801)	0.112 (1.693)
1997	0.185 (2.218)	0.184 (2.298)	0.285 (3.325)	0.276 (3.411)	0.313 (7.162)	0.305 (6.129)
N R squared	1,104 0.95	1,200 0.95	1,104 0.92	1,200 0.92	1,104 0.98	624 0.96
MCP elasticity	0.042	0.063	0.030	0.049	0.019	0.014

(1) Model includes the 12 Two-Plan counties and 11 non-expansion counties, N=1,104 (23 counties).

(2) Model includes the 12 Two-Plan counties, the expansion COHS counties (Orange and Santa Cruz), and 11 non-expansion counties, N=1,200 (25 counties).

(3) Model includes the expansion COHS counties (Orange and Santa Cruz) and 11 non-expansion counties, N=624 (13 counties).

Aidcodes 30 and 34 confer mandatory managed care status in all expansion counties; aidcode 60 confers mandatory managed care status in COHS counties (Orange and Santa Cruz) and non-mandatory managed care status in Two-Plan model counties.

Each model includes county effects and 3 seasonal variables; the omitted county is Ventura County, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.

[a] Can reject hypothesis that $\ln\_s\_enr = 1$, $p<0.05$

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Table 5.16 – Pre and post carve-out CCS claimant volume for aid category 60 (SSI)

Variable	OLS for log (claimants)					
Model	Two plan	Two plan & 11 non-expansion		COHS	COHS & 11 non-expansion	
	(1)	(2)	(3)	(4)	(5)	(6)
Indicator for post carve-out	0.047 (1.024)	0.014 (0.233)	---	0.203 (6.269)	0.228 (3.899)	---
Indicator for post, no default	---	---	-0.038 (0.781)	---	---	-0.055 (1.799)
Indicator for post carve-out, default	---	---	0.072 (0.951)	---	---	0.238 (3.463)
log Medi-Cal enrolled	0.522 (0.956)	1.418 (2.807)	1.705 (3.614)	2.381 (2.641)	2.396[a] (4.027)	2.421[a] (4.113)
Percent PHP ("CCS-include")	0.028 (3.136)	0.018 (2.290)	0.022 (2.580)	0.024 (1.173)	0.011 (1.901)	0.014 (1.803)
1995	0.122 (2.626)	0.119 (3.062)	0.104 (2.734)	0.102 (1.751)	0.119 (2.163)	0.119 (2.161)
1996	0.170 (3.098)	0.148 (3.123)	0.124 (2.749)	0.188 (1.959)	0.118 (1.754)	0.111 (1.692)
1997	0.336 (7.872)	0.340 (8.055)	0.313 (7.874)	0.332 (6.779)	0.308 (6.209)	0.305 (6.132)
N	576	1,104	1,104	144	624	624
R-squared	0.98	0.98	0.98	0.97	0.96	0.96

(1) Model includes the 12 Two-Plan counties, N=576 (12 counties) with fixed county effects and referent Tulare.

(2) and (3) Model includes Two-Plan counties and 11 non-expansion counties, N=1,104 (23 counties) with fixed county effects and referent Tulare.

(4) Model includes expansion COHS counties (Orange and Santa Cruz), N=144 (3 counties) with fixed county effects and referent Tulare.

(5) and (6) Model includes expansion COHS counties (Orange and Santa Cruz) and 11 non-expansion counties, N=624 (13 counties) with fixed county effects and referent Ventura.

Each model includes 3 season dummies, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed. Aid category 60 confers mandatory managed care status in expansion COHS counties (Orange and Santa Cruz) and non-mandatory managed care status in Two-Plan model counties.

[a] Can reject hypothesis that ln_s_enr = 1, $p < 0.05$

the post default period, although very few months comprise the pre-default months and thus the pre-default estimate is not likely to be precise.

While it is difficult to know whether time trends in COHS and Two Plan counties would have been similar absent the carve-out, year dummies for each group of counties were compared. In specifications using the post indicators (**Table 5.16**), both COHS and Two Plan counties appeared to show a similar time trend of increasing claimant volume in the SSI aid category.

As discussed earlier, enrollment in Medi-Cal managed care was voluntary for beneficiaries in aid category 60 in the Two Plan model counties. A monthly average of 6.1 percent of beneficiaries participated during the post carve-out months (**Table 5.14**). The last two columns of **Table 5.15**, which presented results using the continuous measure, illustrate the impact of increasing MCP participation among SSI beneficiaries. A combined model with non-expansion counties is presented as the best representation of carve-out impact. In the Two Plan model counties, a one percent increase in MCP participation among SSI beneficiaries was associated with a 1.9 percent increase in monthly CCS claimants. In contrast, while the expansion COHS counties showed a significant increase in the post indicator specifications, the coefficient for the continuous measure was not statistically significant ($p=0.13$). This may be due to the limited range of values for the managed care variable in the COHS counties, with few observations that were not equal to zero or to 100 percent.

Thus the post indicators show no change in CCS claimant volume for the expansion counties in which SSI eligibility does *not* confer mandatory managed care enrollment. Specifications using the post indicator show there was a substantial increase in claimants for the expansion counties in which SSI eligibility does confer mandatory managed care enrollment. In contrast, results from the continuous variable specification indicate that claimant volume in the SSI category did increase in the Two Plan counties, as managed care participation increased. The smaller participation rates may explain why there was an association with managed care participation rates but not a statistically significant, level increase detectable in the post carve-out period for the Two Plan counties.

With respect to Medi-Cal enrollment, the association with monthly CCS claimant volume was positive with a coefficient close to one (1) for both aid category 30 and aid category 34, as expected. For aid category 60, the coefficient for Medi-Cal enrollment exceeded one in some specifications that included the COHS counties. This finding suggests that a one percent increase in the number of Medi-Cal beneficiaries receiving SSI causes a greater than one percent increase in CCS claimant volume, in these counties. It is not clear why this would occur in COHS and not in Two Plan counties and may result from model fit rather than from an interpretable Medi-Cal program characteristic.

With respect to pre carve-out PHP participation, there generally was no association with CCS claimant volume in specifications for aid categories 30 and 34. In contrast, for SSI beneficiaries in the Two Plan model and non-expansion county specification, there was a positive association between monthly PHP participation and monthly CCS claimant volume. The coefficient also was

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positive but did not reach statistical significance for the COHS expansion counties. This coefficient may be capturing some of the Medi-Cal enrollment increase for this aid category that occurred at the same time that PHP participation rates were higher (**Figure 5.6**).

Summary of Carve-out Impact on Claimant Volume by Aid Category

In summary, the pre-post specifications showed significant increases in claimant volume for Two Plan counties and an even larger increase in COHS expansion counties for the largest aid category (cash assistance) conferring mandatory participation in all expansion counties. Claimant volume increase for the non-cash assistance aid category 34 was significant only for the COHS counties, where it had a magnitude similar to that for aid category 30. The continuous MCP measure showed that within the post carve-out period, there were significant increases in claimant volume as MCP participation increased, for both aid categories and all expansion counties.

In contrast, the two post carve-out indicators showed the expected outcome of no significant increase in claimant volume among SSI beneficiaries in the Two Plan counties, and a significant increase for the COHS counties. Using a continuous measure of managed care participation, showed that in fact claimant volume among SSI beneficiaries did increase in the Two Plan counties as a function of managed care participation. (The fact that in this specification the claimant volume increase in the COHS counties was not significant for the SSI beneficiaries as it had been for the other two aid categories is likely due to the timing of managed care implementation in the COHS counties. In these counties, participation in managed care became mandatory for SSI beneficiaries at a later date, and this date is nearly collinear with the year dummies included in the model to control for time trend. In addition, managed care participation increased from near zero to nearly complete participation almost immediately, thus leaving little variation in the MCP variable with which to estimate the carve-out effect.) Taken together, these findings tended to support the hypothesis of greater impact on claimant volume when managed care participation was mandatory. For example, controlling for covariates, the post carve-out period was associated with a non-significant estimate of a seven percent increase for Two Plan counties, and a significant estimate of over 23 percent for the COHS counties where SSI participation was mandatory.

5.4   Carve-out Impact on the Diagnostic Profile of CCS Claimants

The following section evaluates changes to the composition of CCS participation under the carve-out. It was hypothesized that the carve-out increases the total volume of services authorized by CCS. This effect may extend to all CCS eligible diagnoses and CCS-related services. Alternatively, it could have differential impact on service authorization by diagnosis.

There are several reasons that the diagnostic profile of authorized services and of CCS participants could change. A potential cause of differential impact by diagnosis would stem from past patterns of "circumvention" of CCS authorization. Some paid Medi-Cal claims are known to have bypassed CCS authorization (see Chapter 7). Such claims could comprise a particularly large portion of a post carve-out increase. Those claims that bypassed CCS and were authorized by Medi-Cal field

offices may be of a specific type or related to specific diagnosis types. Another potential cause would stem from the new ways that providers identify CCS eligibility or identify services as potentially CCS eligible. Prior to the carve-out, providers in different specialty/diagnostic areas may have had different referral practices. These practices could stem from differences in knowledge about CCS eligibility, or from different office or clinic management features, for example. Slight changes to authorization practices on the part of local CCS programs are another potential source. Any such changes could relate to specific diagnosis groups or affect authorized services that related to some but not all diagnosis groups. There also could be interactions between some or all of these contributing factors. Whatever the specific contributing factors and their relative weights, the result of the carve-out incentives may be a change in the distribution of services that are authorized, and on the CCS participants who are identified, across different types of CCS eligible medical diagnoses.

Thus overall, the carve-out could cause shifts that are due to more children being identified, to more services being authorized by CCS per program participant, or to a combination where the new program participants have the same or different service use patterns and the already-identified CCS claimants (i.e., those who would have been identified absent the carve-out effect) have more authorized services that traditionally would have bypassed CCS. Absent information about the number of unidentified CCS eligible children, it is difficult to form expectations about caseload compositional changes. If the carve-out causes an "across-the-board" level shift in identified claimants and/or in CCS authorized claims, then an increase in each diagnostic category would be expected. If the carve-out has a differential effect by diagnosis, then increases would be expected to take place in some but not all diagnosis categories. It also is possible that increased MCP participation would be associated with incremental changes in claimant volume for some diagnosis categories while a level shift—but not incremental effects with each percent increase in MCP participation—would result for other diagnosis categories.

Little is known about the specifics of such circumvention other than from the observations reported by CCS program administrators (Chapter 7). While these observations are the perceptions of selected administrators, these observations tend to support the hypothesis of differential carve-out impact by diagnosis. For example, several CCS administrators indicated that historical circumvention of the CCS program may have occurred particularly for orthopedic problems, for young adult trauma, and for some neonatal intensive care unit (NICU) care. CCS administrators in one or more counties also suggested that following the carve-out, they had perceived a larger volume of service requests that were in "gray areas" of CCS eligibility. Examples of such medical diagnoses included urinary tract infections, seizures, diabetes, orthopedics, and hearing loss.

Model Specification

The following analysis examines whether there is a change over time in the distribution of beneficiaries who have claims in a diagnostic category, and whether any changes to this distribution are related to the rate of children's participation in Medi-Cal managed care. The diagnosis coding on CCS authorized Medi-Cal claims was used to evaluate whether there appeared to be differences in the distribution of claim activity across diagnostic "categories". As discussed in Chapter 4, such

diagnosis categories could be drawn from a disease type classification (e.g., ICD-9); from a generic severity index; or from some type of risk adjustment classification system that uses a combination of procedure and diagnosis coding. Due to data availability and for ease in relating the results to CCS eligibility groupings, a disease type approach that uses diagnostic groupings contained in the CCS medical eligibility manual—which also match ICD disease classification groupings—was adopted. These categories are described in more detail in **Table 3.1** and include the following: endocrine/nutritional/metabolic, neoplasm, infection, blood-related, psychiatric, nervous system, sensory system, circulatory system, respiratory system, digestive, genitourinary, musculoskeletal/ connective tissue, congenital anomaly, perinatal, and accident/poisoning/violence/ immunization reaction.[67]

The ideal measure of changes in diagnosis categories would describe changes in the number of children based on their CCS qualifying medical diagnosis. The analysis that follows does not necessarily characterize the CCS qualifying medical diagnosis of CCS participants, however. This is because CCS can authorize any Medi-Cal benefit that is needed by an eligible child, as long as it is related to a CCS eligible medical diagnosis. As a result, the coded diagnosis on a claim could be the qualifying diagnosis, or it could be a non-qualifying diagnosis that is caused by or that affects the CCS eligible diagnosis.

Like the analysis of total claimant volume, counts of monthly claimants with at least one claim in a category were generated for each diagnosis category. Children with one claim or multiple claims in a given month with coding that indicated a given diagnosis category would count equally as one claimant. Each diagnosis code counts once per time period (e.g., month) that it occurred. This permits tabulation of how many beneficiaries had at least one claim with a diagnosis associated with

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[67] To provide detail within each category, the three most frequent diagnoses coded within each CCS diagnosis category were identified for January, April, July, and October 1996. For these frequencies, each beneficiary is counted (at most) once per category per month. These counts are then summed across counties. The volume of claimants with the diagnosis coding is provided as a percent of all monthly claimants in the diagnosis category. (A caveat is that these frequencies do not account for "families" of related codes.) The frequencies are as follows: endocrine (metabolism disease, 14.9%; diabetes mellitus, 11.8%; immunity deficiency, 12.5%); infection (HIV, 20.0%; septicemia, 11.6%; viral chlamydia, 7.0%); blood-related (sickle cell, 31.3%; coagulation defects, 14.5%; thalassemias, 10.9%); psychiatric (developmental delay, 14.9%; speech/language, 9.7%; mental retardation, 8.4%); nervous system (cerebral palsy, 30.6%; congenital quadriplegia, 16.8%; infantile cerebral palsy, 16.0%); sensory system (sensoneural hearing loss, 24.1%; strabismus, 8.7%; hearing loss NOS, 6.9; otitis media, 6.2%); circulatory (heart failure, 8.6%; primary cardiomyopathy, 5.8%; cardiac dysrhythmias, 5.0%); respiratory (pneumonia, 16.8%; asthma NOS, 9.9%; acute upper respiratory infection, 5.4%); digestive (hard tissue disease of teeth, 10.0%; intestinal post-op nonabsorption, 7.9%; noninfectious gastroenteritis, 7.0%); genitourinary (chronic renal failure, 22.4%; other urinary tract infection, 14.0%; nephrotic syndrome NOS, 8.6%); congenital anomaly (spina bifida, 18.1%; cleft palate and lip, 8.4%; ventricular septal defect, 3.7%); musculoskeletal (scoliosis, 10.6%; juvenile chronic polyarthritis, 10.3%; muscle disorders NEC, 6.8%); perinatal (respiratory distress syndrome, 23.9%; other preterm infants, 23.3%; perinatal chronic respiratory distress, 17.3%); accident (other brain injury, 8.2%; infection/inflammation device or graft, 5.4%; femoral fracture, 5.4%).

the category.[68] In addition to these counts, monthly rates were calculated. These counts for a diagnosis category comprised the numerator, and the denominator was the total number of monthly claimants. Taking this approach means that the claimant counts by diagnosis category that are discussed in subsequent sections are not mutually exclusive counts. It is possible that claimants in a diagnosis category as a proportion of all monthly claimants could increase in all diagnosis categories.

Claims with no diagnosis coding   The counts and rates of CCS claimants by diagnosis category rely on diagnostic coding. As a result, the fact that some CCS-authorized claims do not have diagnosis coding could affect inference about changes across diagnosis categories. This could occur if patterns in non-coded claims change over the study period. For example, growth in claims that do not have diagnosis coding could lead to a larger proportion of claimants not being classified within a relevant diagnosis category. Ambulance and laboratory services are examples of claim types that do not require diagnostic coding. Also, analyzing total claimants by diagnosis category does not capture children whose services in the month all lack diagnosis coding. (A count of children per month whose services all lacked diagnosis coding will show the potential impact of this limitation.) A concern is that changing patterns of missing diagnosis information over time might dominate the results, rather than changes to the composition of CCS participants.

The claims that could not be classified into diagnosis groups were found to fall into two categories: (1) claims that are absent any diagnosis coding, or that have invalid coding; and (2) claims with coding that is not classifiable within the disease categories of the CCS and ICD systems. The second group is composed largely of "V code" or "E code" procedure codes and symptom-related codes.[69] To gain some understanding about what claims have missing diagnosis information, and further to learn whether there are trends in the volume of claims by procedure type, tabulations of the missing information and multivariate analysis of the trends were evaluated.

Table 5.17, Vendor type for CCS-authorized Medi-Cal claims that lack diagnostic information—Totals and by mandatory managed care group status shows the frequencies of claims that have missing diagnosis information. This table provides the overall frequencies and also the frequencies when disaggregated by the vendor type associated with the claim. The frequencies were further stratified by the mandatory/non-mandatory status of the claimant. There was no indication that the claims that were absent diagnosis information increased or declined as a proportion of all claims over the study period. As a proportion of all claims, the claims that were absent diagnosis information comprised 11.2 percent of mandatory group claims and 21.7 percent of non-mandatory group claims for service dates between 1994 and 1997. While this indicates a substantial difference between groups, the concern was whether there were time trends for the

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[68] Adjustment claims are not distinguished from regular claims in these counts because they have identical diagnosis information and are associated with the same service date. Consequently they have no effect on the monthly summary counts of claim activity per beneficiary.

[69] A small number of claims were not identified using the 1999 ICD-9 coding; the majority could be coded using an older version of ICD (1992). Very few of the claims have codes that clearly are invalid.

Table 5.17 – Vendor type for CCS-authorized Medi-Cal claims that lack diagnostic information—Totals and by mandatory managed care group status

Vendor type [a] for claim	Total CCS-authorized Medi-Cal claims without ICD-9 coding				Combined 94-97
	Year				
	1994	1995	1996	1997	
	Total (N, %) MC Non-MC	Total (N, %) MC Non-MC	Total (N, %) MC Non-MC	Total (N, %) MC Non-MC	Total (N, %) MC Non-MC
Pharmacist	60,590 (79.5%) 12,973 (80.3%) 47,617 (79.4%)	70,514 (84.2%) 14,643 (83.9%) 55,871 (84.3%)	92,365 (88.4%) 16,634 (85.5%) 75,731 (89.0%)	111,366 (88.8%) 17,483 (84.2%) 93,833 (89.7%)	334,835 (85.9%) 61,733 (83.6%) 273,102 (86.4%)
Other provider	7,488 (9.8%) 958 (5.9%) 6,530 (10.9%)	6,888 (8.2%) 925 (5.3%) 5,963 (9.0%)	4,060 (3.9%) 650 (3.3%) 3,410 (4.0%)	3,897 (3.1%) 565 (2.7%) 3,332 (3.2%)	22,333 (5.7%) 3,098 (4.2%) 19,235 (6.1%)
Indep rehab facility	3,936 (5.2%) 347 (2.2%) 3,589 (6.0%)	2,629 (3.1%) 215 (1.2%) 2,414 (3.6%)	3,931 (3.8%) 354 (1.8%) 3,577 (4.2%)	3,905 (3.1%) 393 (1.9%) 3,512 (3.4%)	14,401 (3.7%) 1,309 (1.8%) 13,092 (4.1%)
Dentist	1,468 (1.9%) 940 (5.8%) 528 (0.9%)	1,698 (2.0%) 1,046 (6.0%) 652 (1.0%)	1,762 (1.7%) 1,110 (5.7%) 652 (0.8%)	1,878 (1.5%) 1,084 (5.2%) 794 (0.8%)	6,806 (1.7%) 4,180 (5.7%) 2,626 (0.8%)
Physician group	307 (0.4%) 146 (0.9%) 161 (0.3%)	171 (0.2%) 68 (0.4%) 103 (0.2%)	367 (0.4%) 183 (0.9%) 184 (0.2%)	2,551 (2.0%) 799 (3.8%) 1,752 (1.7%)	3,396 (0.9%) 1,196 (1.6%) 2,200 (0.7%)
Medical transport	632 (0.8%) 161 (1.0%) 471 (0.8%)	521 (0.6%) 95 (0.5%) 426 (0.6%)	424 (0.4%) 82 (0.4%) 342 (0.4%)	636 (0.5%) 164 (0.8%) 472 (0.5%)	2,213 (0.6%) 502 (0.8%) 1,711 (0.5%)
Clinical lab	498 (0.6%) 206 (1.3%) 292 (0.5%)	438 (0.5%) 212 (1.2%) 226 (0.3%)	579 (0.6%) 197 (1.0%) 382 (0.4%)	115 (0.1%) 29 (0.1%) 86 (0.1%)	1,630 (0.4%) 644 (0.9%) 986 (0.3%)
Hearing aid dispenser	546 (0.7%)	255 (0.3%)	228 (0.2%)	175 (0.1%)	1,204 (0.3%)
Home health agency	145 (0.2%)	128 (0.2%)	256 (0.2%)	554 (0.4%)	1,083 (0.3%)
TOTALS AND AS % OF *ALL* CCS CLAIMS [b]	76,176 (18.3%) 16,164 (11.1%) 60,012 (22.1%)	83,745 (18.8%) 17,447 (12.4%) 66,298 (21.8%)	104,547 (19.0%) 19,455 (12.0%) 85,092 (21.9%)	125,416 (17.9%) 20,756 (9.9%) 104,660 (21.2%)	389,884 (18.4%) 73,822 (11.2%) 316,062 (21.7%)

[a] Categories of vendor types with fewer than 1,000 total occurrences of missing diagnosis information for the study period (1994—1997) include the following: Prosthetist, Community hospital—Outpatient,

Audiologist, Physician, Orthotist, Community hospital—Rehabilitation, Blood bank, Home & Community Based Waivers, Physical therapist, Occupational therapist, Speech therapist, County hospital—Rehabilitation, Acupuncture, County hospital—Outpatient, Community hospital—Renal dialysis, Outpatient clinic, Community hospital—Hemodialysis, Dispensing optician, Surgicenter, Optometrist, Community hospital—Inpatient, EPSDT Supplemental Services, Podiatry, and Missing/No information.

[b] The percentages in the bottom row use a denominator of total CCS-authorized claims for the specified time period. The denominators of all claims (not stratified by mandatory managed care status) are as follows: 417,057 (1994); 444,920 (1995); 549,303 (1996); 701,708 (1997). The denominators exclude only those that are adjustment claims, or that appear for a Medi-Cal aid code or county code deemed to be invalid.

groups or different time trends for the groups. There was little evidence of a significant time trend in the prevalence of non-coded claims for either group.

The composition of these claims was further examined by looking at the types of providers ("vendors") who were the sources of the claims. Classification by vendor category shows the procedure type for the non-coded claims. Some claims are not expected to have diagnosis coding. Specifically, Medi-Cal does not require claims for pharmacy, laboratory, anesthesiologist, and selected other services to have diagnosis coding for payment. **Table 5.17** shows that most claims that lacked diagnosis coding were for pharmacy. Pharmacy claims comprised 79.5 percent of non-coded claims in 1994, 84.2 percent in 1995, 88.4 percent in 1996, and 88.8 percent in 1997. While compositional changes are indicated, these figures do not point to prevalence of absent diagnosis information as a cause of changes to claimant counts by diagnosis category.

Claims coded but without ICD classifiable disease category Another group of claims that could not be assigned to a diagnosis category included the ICD system V and E coded claims[70] The most frequent among these codes were similar for the mandatory and the non-mandatory groups. They included live born infant (37 percent of the V and E coded claims in the mandatory group, 15 percent in the non-mandatory group); laboratory exam (8 percent in mandatory, 12 percent in non-mandatory); and chemotherapy (6 percent in mandatory, 10 percent in non-mandatory).

Some claims with valid ICD coding were symptoms rather than diseases and as such did not fall into any of the 15 diagnosis categories used in this analysis. The most frequent ICD-9 codes among this group were the following: lack of normal physiological development (9 percent in the mandatory group, 12 percent in the non-mandatory group); convulsions (9 percent in mandatory, 12 percent in non-mandatory); and respiratory/chest symptoms (11 percent in mandatory, 9 percent in non-mandatory). There also were a small number of claims with invalid ICD-9 codes.

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[70] V codes are an ICD-9 category for factors other than a classifiable disease under ICD that cause health services encounters. Such encounters include the following: (1) prophylaxis or organ/tissue donation; (2) specific treatments for current or resolving conditions (e.g., renal dialysis, chemotherapy); and (3) a problem that influences the individual's health status but is not a disease or injury itself (PMIC 1992).

Given the objective of classifying children monthly into diagnosis categories, the possibility of using any valid codes from another time period to assign claimants to the 15 diagnosis categories was considered. However, it would be inappropriate to assign a claimant to a disease category, using other valid coding for the beneficiary from previous months. In some cases the beneficiary has claims classified in multiple categories for the month and/or over time (e.g., circulatory diagnosis; congenital anomaly diagnosis). In other cases, beneficiaries do not have valid coded claims from other study period months. Thus a separate diagnosis category of "other/missing" was created for counts of claimants with absent/invalid diagnosis information on a claim for further analysis. Claimants having claims with V codes (a category for certain treatments and encounters) or E codes (a category for environmental factors that cause adverse events) comprised a second additional category. The association between the carve-out and the prevalence of claims that were absent classifiable diagnosis coding (i.e., within the 15 diagnosis categories) is explored further in the multivariate analysis.

Findings for Claimant Volume By Diagnosis Category

These analyses focus on the Two Plan counties and non-expansion counties. Results are presented as follows. First, trends in claimant volume across diagnostic categories are described for the pre and post periods overall and by Two Plan expansion county.[71] This is followed by pre post comparisons of claimants within a diagnosis category as a proportion of all monthly claimants. The multivariate analyses are the focus of this section and estimate carve-out impact controlling for time trends and fixed county differences.

Analysis of variance: Total claimants

Bivariate pre-post comparisons are summarized in this section. It is important to note that the bivariate pre-post comparisons do not control for changes over time, or for the fact that the "pre" and "post" periods are defined differently for each county based on the date of the county's carve-out. This is particularly important given the potential seasonal aspect of claimant activity within diagnosis categories. This issue is discussed in more detail with the presentation of multivariate specification results, which follows the description of overall trends provided in this section.

Tests for the equality of means in the pre and the post period first were conducted for all Two Plan counties combined. A comparison of overall pre-post means for the Two Plan counties showed no significant differences in claimants within diagnosis categories, and in some cases overall declines in claimant volume (data not shown). The lack of an overall effect is not surprising. There is substantial variability in population across the counties and thus large standard errors associated with the overall means. In comparisons that combine counties without accounting for county size, the influence of Los Angeles County (in which claimant volume had generally remained stable or declined after the carve-out) dominates the effect measures.

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[71] As in earlier analyses, the Post period is defined for each county as those months in which the carve-out was in effect for one or both Medi-Cal managed care plans in the particular county.

Tests for the equality of means were next conducted for each expansion county (data not shown). Bivariate results presented earlier in section indicated that total claimant volume increased between the pre and post carve-out periods for both mandatory and mandatory groups in seven (7) of the eleven (11) Two Plan counties with an operating carve-out. It increased for the non-mandatory group only in two (2) of the counties. Total claimant volume actually declined for the mandatory group in the remaining two (2) counties.

For Fresno and Kern counties, total claimants increased within nearly all diagnosis categories for the mandatory and non-mandatory groups. Results for the other expansion counties were more mixed. Mean monthly volume of claimants by diagnosis category in the pre and post carve-out periods are provided for three expansion counties in **Table 5.18**, **Pre and post carve-out, CCS claimants with claim in diagnosis categories—Selected Two Plan counties, by Medi-Cal managed care group status**. These counties were selected because they had demonstrated different claimant volume trends overall. These counties are Alameda, Kern, and Santa Clara. Earlier findings indicated an increase in CCS claimant volume for Kern and a more modest increase for Alameda County. In contrast, monthly claimant volume (as well as Medi-Cal enrollment) had appeared to decline for the mandatory group in Santa Clara County over the study period, from 192 to 175 children monthly.

For Alameda and Kern, the findings indicate increasing numbers of children with monthly claims associated with a category for most diagnosis categories and for both mandatory and non-mandatory groups, between the pre and post carve-out periods. In Kern, the perinatal diagnosis category indicated an increase in contrast to the experience in other counties. Increased claimant activity in the perinatal category was found for the mandatory and non-mandatory groups. In Alameda, exceptions for the mandatory group were found in the lower prevalence diagnosis categories (psychiatric, pregnancy) and also in the sensory, perinatal, and musculoskeletal categories. No change in claimant volume within the musculoskeletal category was found for the non-mandatory group. In Santa Clara, declines or no change in claimant volume were found across nearly all diagnosis categories. The only exceptions were increases for the non-mandatory group in the infection and the genitourinary categories.

Analysis of variance: Distribution of claimants across diagnosis categories

Totals of children with claims in specific diagnosis categories were next evaluated as a proportion of all claimants. This measure directly addresses the hypothesis of changing distribution of CCS participation with respect to diagnosis. Results from the bivariate pre-post comparisons are summarized for the distribution of claimants across diagnostic categories. Differences between the mandatory and non-mandatory groups are discussed as well as differences in carve-out impact between the groups. These comparisons do not adjust for possible CCS case-mix changes attributable to Medi-Cal enrollment, PHP participation, or seasonal effects that could differentially affect county comparisons based on their carve-out implementation dates.

Table 5.18 – Pre and post carve-out: CCS claimants with claim in diagnosis categories—Selected Two Plan counties, by Medi-Cal managed care group status

Mean number of claimants having 1+ claim with ICD-9 in diagnostic category [a]

Mean (s.d.)

Diagnosis category	Alameda (mean, s.d.)				Kern (mean, s.d.)				Santa Clara			
	Mandatory		Non-mandatory		Mandatory		Non-mandatory		Mandatory		Non-mandatory	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Endocrine, nutrition, metab	5.6 (2.7)	24.9 (10.0) ***	8.0 (3.3)	15.8 (5.3) ***	4.3 (2.0)	11.9 (5.2) ***	9.2 (2.7)	12.6 (4.3) ***	8.7 (2.6)	7.5 (2.6)	12.5 (3.3)	10.5 (5.5)
Neoplasm	11.0 (4.7)	18.1 (6.9) ***	21.3 (5.2)	22.1 (4.3) ***	5.0 (2.5)	12.1 (4.5) ***	10.7 (3.4)	20.7 (7.7) ***	20.2 (6.1)	17.7 (6.4)	36.4 (5.8)	20.3 (7.9) ***
Infection	3.4 (1.5)	10.5 (5.1) ***	5.5 (2.2)	12.5 (5.1) ***	2.1 (1.6)	6.2 (3.2) ***	3.9 (2.3)	6.5 (2.2) ***	4.1 (1.6)	3.0 (2.1) ***	8.1 (2.6)	6.3 (2.9) ***
Blood	8.6 (2.8)	20.2 (6.9) ***	21.5 (4.5)	28.8 (5.9) ***	2.2 (1.4)	5.9 (3.0) ***	5.5 (2.2)	9.9 (2.8) ***	8.9 (3.3)	4.4 (2.1) ***	11.3 (2.8)	9.2 (2.5) *
Mental	2.1 (1.6)	2.9 (1.6) **	2.9 (2.2)	7.0 (3.9) ****	0.4 (0.6)	1.0 (1.1) ***	0.9 (0.9)	2.2 (1.3) ***	1.7 (1.3)	1.1 (1.1)	2.4 (2.0)	1.5 (1.4)
Nervous	16.7 (4.4)	19.8 (5.2) **	108.2 (29.4)	152.2 (20.9) ***	5.0 (2.8)	10.4 (3.7) ***	31.5 (8.6)	48.2 (8.0) ***	18.9 (6.6)	16.8 (6.7)	109.4 (35.2)	108.5 (19.7)
Sensory	27.0 (9.1)	26.3 (7.6)	24.7 (6.4)	40.0 (11.6) ***	11.6 (3.5)	25.7 (10.9) ***	13.4 (3.7)	22.2 (5.9) ***	14.6 (4.7)	13.0 (3.6)	16.9 (5.6)	18.2 (5.3)
Circulatory	6.9 (3.1)	10.4 (3.3) ***	5.9 (2.4)	10.6 (3.1) ***	2.5 (1.8)	7.9 (4.5) ***	2.6 (1.7)	6.0 (2.5) ***	6.5 (3.0)	6.6 (2.3)	10.3 (3.4)	7.0 (2.7) ***
Respiratory	8.0 (5.2)	12.9 (7.5) **	14.7 (5.2)	25.7 (10.4) ***	6.4 (2.9)	8.1 (4.0) *	10.8 (4.6)	25.2 (6.5) ***	8.7 (3.7)	8.6 (4.3)	16.1 (5.1)	14.8 (4.7)
Digestive	8.2 (2.8)	11.7 (3.8) ***	11.2 (4.4)	16.7 (4.9) ***	4.2 (2.0)	5.9 (3.2) *	7.2 (2.6)	10.6 (2.6) **	6.8 (2.8)	5.9 (3.7)	12.1 (6.0)	11.4 (4.8)
Genitourinary	4.5 (2.5)	10.9 (3.9) ***	5.4 (2.2)	7.4 (3.1) **	3.5 (1.7)	11.4 (3.1) ***	3.7 (2.0)	6.4 (2.6) ***	8.1 (3.1)	6.8 (3.5)	8.9 (3.1)	6.5 (2.7) ***
Pregnancy	0.1 (0.3)	0.1 (0.4)	0.0 (0.2)	0.8 (0.8) ***	0.0 (0.0)	0.2 (0.4) **	0.0 (0.2)	0.4 (0.8) **	0.4 (0.6)	0.1 (0.2) *	0.1 (0.3)	0.1 (0.2)

Mean number of claimants having 1+ claim with ICD-9 in diagnostic category [a]

Mean (s.d.)

Diagnosis category	Alameda (mean, s.d.)				Kern (mean, s.d.)				Santa Clara			
	Mandatory		Non-mandatory		Mandatory		Non-mandatory		Mandatory		Non-mandatory	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Skin	1.6 (1.3)	2.6 ** (1.5)	1.8 (1.6)	2.9 ** (1.9)	1.0 (0.9)	2.0 *** (1.2)	0.8 (1.0)	2.0 *** (1.5)	1.9 (1.4)	2.3 (2.0)	4.3 (1.9)	4.2 (2.2)
Musculoskeletal	10.8 (3.5)	12.2 (2.6)	15.3 (3.6)	16.8 (3.8)	4.9 (2.6)	9.8 *** (4.9)	7.3 (2.8)	10.8 *** (3.3)	8.6 (4.0)	9.7 (3.2)	11.8 (3.9)	11.6 (3.3)
Congenital	43.3 (6.9)	52.2 *** (10.0)	43.2 (6.4)	64.4 *** (2.0)	19.2 (5.6)	44.0 *** (15.5)	26.9 (5.9)	44.7 *** (9.9)	41.8 (9.7)	45.2 (10.0)	59.0 (12.1)	53.5 (7.9)
Perinatal	36.0 (9.3)	34.8 (5.2)	17.4 (5.3)	25.1 *** (6.3)	8.5 (3.2)	34.4 *** (12.6)	3.6 (2.3)	18.2 *** (10.0)	28.2 (6.5)	19.1 *** (6.5)	36.3 (13.4)	28.1 * (16.1)
Accident, poisoning, violence, IZ reaction	20.3 (6.7)	33.2 *** (12.1)	17.5 (5.7)	27.1 *** (7.8)	11.3 (4.2)	48.6 *** (28.6)	6.9 (2.9)	11.6 *** (3.5)	18.1 (5.1)	19.5 (6.8)	16.0 (4.1)	10.6 *** (4.0)
TOTAL CLAIMANTS	314.7 (36.6)	419.3 *** (49.4)	195.3 (3.6)	248.5 *** (6.5)	103.6 (17.5)	195.0 *** (38.0)	157.2 (15.8)	233.2 *** (32.6)	192.4 (20.5)	174.6 *** (18.9)	325.7 (43.6)	318.9 (20.8)

[a] An individual may have claims in more than one diagnostic category within a month, or in none if no diagnosis code is associated with the claim(s)

* p<0.10, ** p<0.05, *** p<0.01

Pre and post carve-out comparisons of the proportion of CCS claimants having claims associated with specific diagnosis categories are provided for the Two Plan model counties in the appendix as **Table D.1, Pre and post carve-out percent of monthly claimants with claims in diagnosis categories: Endocrine/metabolic/nutritional, neoplasm, infection**, and in **Tables D.2, D.3, D.4, D.5**, and **D.6**. The pre and post values are the total children with one or more claims in the month having coding for a specific diagnosis group, as a proportion of all children with one or more claims in the month. **Baseline differences by mandatory group status: Percent in diagnosis categories**

These data show underlying differences in prevalence of claimants having claims in specific diagnosis categories. These differences occur between the mandatory and non-mandatory groups across both pre and post carve-out periods. A larger percentage of CCS participants in the non-mandatory group than in the mandatory aid categories have claims coded for the following diagnosis groups: neoplasm, infection, blood-related diagnoses, psychiatric, respiratory, and nervous system (also in the "other" category). SSI beneficiaries comprise the largest aid category (37.5 percent of all beneficiaries) within the non-mandatory group in Two Plan counties. Children with CCS eligible medical diagnoses who are receiving SSI would be those with chronic disabling conditions expected to last at least 12 months and constituting marked limitations in functioning. On average, these children are less likely than children in poverty-related Medi-Cal aid categories to have only self-limiting or short-term, correctable diagnoses.

In contrast, a larger percentage of CCS participants in the mandatory group have claims with coding for the following diagnosis groups: endocrine/nutrition/metabolic, sensory, genitourinary, musculoskeletal, congenital anomaly, perinatal diagnoses, and for the accident/violence category (also in the V/E code category). AFDC/TANF recipients and mothers and children who receive Medi-Cal through the medically indigent aid categories comprise the majority of beneficiaries in the mandatory group. In general, unlike many children in the non-mandatory aid categories group, children in the mandatory aid categories group do not have their Medi-Cal eligibility specifically linked to their health status. Thus their CCS eligibility is more likely to be "incidental" to their Medi-Cal eligibility status, relative to children in the non-mandatory group.

Pre-post carve-out differences: Percent in diagnosis categories

To evaluate whether the increasing claimant volume occurred with the same magnitude across diagnosis categories, the percent of total monthly claimants having at least one claim in a category was compared across diagnosis categories. Analysis of variance was used to evaluate whether the monthly values for percent of claimants with specific diagnosis types changed between the pre and post carve-out periods. By treating each monthly value for each county equally, the overall mean represents the mean for Two Plan counties. These means for all 11 Two Plan counties combined are unweighted for county population. When unweighted, these values capture the average county pre-post experience. These values do not represent the pre-post differences across all *claimants* in Two Plan model counties. That difference would be heavily weighted by the experience in the most populated counties (primarily Los Angeles County).

There were pre-post carve-out differences in the proportion of all claimants within different diagnosis categories for both mandatory and non-mandatory groups. Large differences in the percent of monthly claimants having claims in diagnosis groups were found for the pre and post periods for the mandatory groups in many diagnosis groups. For the mandatory managed care group, the mean monthly percent of claimants within a diagnosis category was higher in the post carve-out period than in the pre carve-out period for 13 of the 15 categories. These categories included the following: endocrine/nutrition/metabolic; neoplasm; infection; blood-related; psychiatric; nervous system; circulatory; respiratory; digestive; genitourinary; musculoskeletal; congenital anomaly; and accident/poisoning/violence/immunization reaction. The only categories with no increase were sensory and perinatal (with perinatal showing a decline), and also the V/E code category. Higher rates in the post period were found for nine (9) of the diagnosis categories for the non-mandatory group as well. Post carve-out rates did not differ from the pre period for the other six (6) categories of neoplasm, blood-related, sensory, congenital, perinatal, or accident categories (or the V/E code category).

Diagnosis categories for which there was increased percent of claimants for the mandatory group but *not* for the non-mandatory group included neoplasm, blood-related, congenital anomaly, and accident. Overall, combining the 11 Two Plan model counties that implemented mandatory Medi-Cal managed care by the end of 1997, the only statistically significant *declines* in percent of monthly claimants were found for perinatal diagnoses (for the mandatory group only). These differences in means are consistent with a carve-out effect. However, these means do not control for time trends. This is particularly a limitation for diagnosis categories where claimant volume has a large seasonal component. Most county post carve-out periods within the 1994-97 study period are not equally "balanced" in terms of the seasons covered.

The county-specific trends for counts within diagnosis categories tended to replicate earlier findings for total monthly claimant counts. For example, in Alameda County the percent of monthly CCS claimants with related claims at least doubled for the following diagnosis categories: endocrine/nutritional/metabolic, infection, blood, circulatory, and genitourinary. There were some exceptions in which the non-mandatory group showed pre-post increases but the mandatory group did not. These exceptions included Kern County (neoplasm), Alameda (congenital anomaly), and Contra Costa (sensory), in addition to a number of counties for the infection category, and Riverside across many of the diagnosis categories. The perinatal diagnosis category showed mixed results. In some counties, perinatal diagnoses fell as a proportion of monthly claimants more in the mandatory group than in the non-mandatory group. Kern was the exception in showing an increase in the percent perinatal for both groups.

It is possible that a change in service mix involving a shift to non-coded services (e.g., pharmacy) or other changes to claim coding practices could affect pre-post comparisons. An important question is whether the proportion of claimants having a claim for "other" diagnoses or non-coded services or V/E codes could drive changes. For example, there could be an increase in children whose only authorized claim in a month is pharmacy. These children will not appear in the numerator for the

relevant diagnosis category or categories. The bivariate findings suggest that the percent of children with an "other" claim increased slightly for both groups (from 38.7 percent to 41.7 percent of claimants in the non-mandatory group, and from 21.2 percent to 24.5 percent in the mandatory group). The percent of children having claims in the other large category of non-coded services (V/E codes) did not differ between the pre carve-out period months and the post period months (**Table D.6**). Both the "other" and "V/E code" categories include children with claims only in these categories, as well as children who have claims in other categories, however. Thus as constructed, these categories do not illustrate whether there was a pre-post change in children who *only* receive services that fall into the "other/missing" or "V/E code" categories.

To summarize the bivariate findings, claimants with coded claims in diagnosis categories increased in nearly all categories for the mandatory group. There were also increases for the non-mandatory group. This is not surprising given the time variant CCS program changes and the potential changes in authorization deferral practices by the Medi-Cal field offices, and given the fact that changes in referral practices could affect both mandatory and non-mandatory groups. There was indication that the carve-out had a more substantial effect on claimant activity within a given diagnosis group for the mandatory group. Further, increased claimant activity appeared in all diagnosis categories for the mandatory group with the exception of perinatal. Increased claim activity as a percent of all claimants was found for the mandatory group but not the non-mandatory group in diagnosis categories of neoplasm, blood-related, congenital anomaly, and the pooled category of accident/violence. The fact that there were increases in most categories supports an explanation of less CCS circumvention associated with the carve-out, and possibly billing changes caused by or coincidental to the carve-out. It does not seem likely that the volume of monthly claimants with a neoplasm or congenital anomaly would increase substantially, even if circumvention of CCS for some services, or increasing use of ambulatory services that were infrequently authorized by CCS in the early part of the study period, did in fact cause more services for such children to be authorized.

Aside from the carve-out effects, the results also reveal some differences across counties in the percent of children having claims coded with particular diagnoses. Baseline differences were expected due to county diversity in population and health risk factors. Although local health care infrastructure would not necessary affect CCS caseload composition, since even children receiving services outside their county of residence could still be identified as a beneficiary from their county of residence, sizable differences in claimant activity for certain diagnosis groups were evident. Another finding from comparison across counties was that pre-post differences in claimant *volume* did not always occur consistently for the mandatory and non-mandatory groups. However, the changes in *rates* of claimants in a diagnosis category per total claimants did tend to appear consistently for mandatory and non-mandatory groups. Because these pre-post comparisons do not control for other time variant trends, however, the pre-post changes cannot be attributed solely to the carve-out incentives.

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Multivariate analysis of total CCS claimants with claims in diagnosis categories

The multivariate analysis controls for time trends, seasonal effects in disease patterns, and the Medi-Cal and PHP participation variables. Seasonal effects could have particular impact on pre-post carve-out comparisons at the diagnosis category level. This is due to seasonal variation in disease patterns. Some of the diagnosis categories are more likely to display seasonal variability, such as respiratory illness. These disease patterns could affect the estimates of impact because of the study's time series design. The pre-post comparisons were not limited to the full calendar years in the pre and post periods, which would have made the pre and post periods comparable in terms of seasonal composition. This was not viable because there were different managed care/carve-out implementation dates across counties and short follow-up (post carve-out) periods for some counties. Thus multivariate analysis that controls for seasonal effects is most appropriate for evaluating pre-post carve-out changes by diagnosis. The bivariate comparisons also do not account for varying Medi-Cal enrollment or PHP participation. These factors could affect base population characteristics and thereby alter "case-mix" of CCS claimants.

The OLS models include the number of children with a claim coded in a diagnosis category as the dependent variable. Independent variables include a pre-post indicator(s) (or the continuous MCP variable; Medi-Cal enrollment; PHP participation; year; season (quarter); and fixed county effects in specifications that combined observations from multiple counties. A null hypothesis for the analysis of diagnosis-related trends is that the volume of monthly CCS claimants for specific diagnosis categories was equivalent in the months prior to and in the months following the carve-out, all things equal.

Individual Two Plan counties

Earlier results for the Two Plan counties showed pre-post carve-out declines in claimant volume for certain diagnostic categories in some counties. It is possible that MCP participation could be associated with a higher volume of claimants in counties that showed no significant pre-post differences. This could occur if there was a time trend of declining volume but an increase associated with MCP participation. Results show that in fact, MCP participation was associated with a significant increase in claimant volume for a given diagnosis category, in some counties that had shown a negative overall time trend or no difference in the pre-post comparison of the equality of means(data not shown).. For example, in Santa Clara County, no pre-post difference in claimant volume within the endocrine diagnosis category was found. In the multivariate specification for this county, the year dummies indicated a negative time trend and thus were consistent with the pre-post comparison. However, the MCP coefficient was positive and statistically significant for the mandatory and the non-mandatory groups. This suggests that MCP participation did increase CCS participation around this diagnostic category despite a general decline.

Table 5.19 – Regression coefficients for CCS claimants by diagnosis category, using pre-post indicators—Two plan and non-expansion counties (coefficients and absolute t statistics)

Dependent variable (claimants in diagnosis category)	Coefficients for post carve-out indicators			
	Non-mandatory		Mandatory	
	Post carve-out, no default (post1_a)	Post carve-out with default (post2_a)	Post carve-out, no default (post1_a)	Post carve-out with default (post2_a)
Endocrine/nutritional /metabolic	0.083 (0.670)	0.251 (1.701)	0.208 (1.731)	0.979 (3.633)
Neoplasm	0.191 (1.332)	0.281 (1.405)	0.250 (2.387)	0.790 (4.232)
Infection	0.198 (1.516)	0.448 (2.351)	0.199 (1.850)	0.694 (3.366)
Blood-related	-0.007 (0.099)	0.223 (1.864)	0.086 (0.708)	0.644 (3.588)
Psychiatric	0.323 (2.045)	0.424 (1.662)	0.090 (2.717)	0.240 (1.543)
Nervous system	-0.078 (0.621)	-0.041 (0.396)	0.005 (0.042)	0.420 (2.561)
Sensory system	-0.139 (1.878)	0.043 (0.408)	-0.174 (1.811)	0.115 (0.724)
Circulatory	0.260 (1.502)	0.645 (2.934)	0.510 (2.493)	0.890 (4.021)
Respiratory	0.194 (2.405)	0.389 (2.316)	0.216 (1.644)	0.475 (1.794)
Digestive	0.114 (1.115)	0.249 (1.433)	0.206 (2.093)	0.641 (2.941)
Genitourinary	0.154 (0.893)	0.463 (2.781)	0.341 (3.183)	0.821 (3.276)
Musculoskeletal	0.089 (0.888)	0.131 (0.867)	0.145 (1.421)	0.526 (2.848)
Congenital anomaly	-0.031 (0.483)	0.122 (1.087)	-0.018 (0.250)	0.327 (2.110)
Perinatal	0.058 (0.549)	0.469 (1.631)	-0.036 (0.249)	0.422 (1.411)
Accident/Violence/ Poisoning/IZ reaction	0.031 (0.431)	0.135 (0.998)	0.239 (1.943)	0.716 (4.015)
Other	-0.058 (1.258)	-0.004 (0.050)	0.078 (0.720)	0.322 (1.875)
Vcodes/Ecodes	-0.027 (0.443)	0.053 (0.472)	0.120 (1.566)	0.362 (2.389)

Each model includes Medi-Cal enrollment, PHP participation, county fixed effects, 3 year dummies, and 3 season dummies; the omitted county is Tulare County, the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed. For each model, N=1,104 (12 Two Plan counties and 11 non-expansion counties).

Combined Two Plan and expansion counties

Specifications using a post carve-out indicator for the initial carve-out months, and a second indicator for the post default months, indicated increased claimant volume across many of the constructed diagnosis categories. **Table 5.18, Regression coefficients for CCS claimants by diagnosis category, using pre-post indicators—Two Plan and non-expansion counties** shows the coefficients for the carve-out effect measures. Increased claimant activity was found for most diagnosis categories with the larger effects occurring the post default period. Of those categories showing a significant effect, the increase in claimant volume associated with the post default period ranged from a 38 percent increase (congenital anomaly) to a more than 150 percent increase (endocrine/nutritional/metabolic diagnoses). The results that follow use a combined model with Two Plan and 11 non-expansion counties. **Table 5.20A and 5.20B, Regression results for total children with CCS claims in diagnosis categories— Mandatory managed care groups in Two Plan and non-expansion counties**, show the association in the mandatory group between MCP participation rates and the monthly totals of children having at least one claim associated with a particular diagnosis category. For the mandatory group, MCP participation has large, significant effects on claimant volume across nearly all diagnosis categories. One exception was claimant volume in the perinatal category. In bivariate analyses, the mean monthly claimant volume associated with this diagnosis category was lower after the carve-out. In contrast, the coefficient for MCP participation was positive (though not statistically significant). The other exception was the sensory category, which had a positive but not significant coefficient.

None of the year dummies was statistically significant ($p < 0.10$) in several categories. The diagnosis categories that suggest no independent time trend are psychiatric, circulatory, respiratory, digestive, and perinatal (also V/E codes). With the exception of the perinatal category, MCP participation was associated with higher claimant volume within each of these categories.

Results of the specifications for the non-mandatory aid categories group are provided in **Tables 5.21A** and **5.21B**. Results for the non-mandatory group also show increases with the exception of the nervous system category, where the coefficient approaches significance. For the non-mandatory group, several diagnosis categories that suggest no independent time trend (having no significant coefficients for year dummy variables)—neoplasm, blood-related, circulatory, genitourinary, and perinatal—do indicate increased claimant volume associated with increasing MCP participation.

The results presented for specifications using one continuous measure of MCP participation assume that there are no differences in slope between the initial carve-out months and the later, post-default months. A final question was whether growth in managed care participation within each of these two carve-out "periods"—pre default and post default—was associated with increased claimant volume. Small numbers for some of the diagnosis categories make it difficult to answer this question. A specification using two post indicators and a continuous MCP variable for each of the post carve-out periods was used (data not shown). For the endocrine/metabolic/nutritional category, the slopes were not significant for both periods in the non-mandatory group ($p = 0.23$ and $p = 0.03$, respectively) but

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Table 5.20A – Regression results for total children with CCS claims in diagnosis categories – Mandatory managed care aid categories in Two Plan and non-expansion counties (coefficients and absolute t statistics)

Variable	Endocrine, nutritional, metabolic	Neoplasm	Infection	Blood	Psychiatric	Nervous system	Sensory system	Circulatory system	Respiratory
	Total Children with Claim in Diagnosis Category								
Percent MCP (pct2cpli)	0.015 (4.328)	0.009 (3.988)	0.010 (3.655)	0.012 (8.841)	0.004 (1.837)	0.008 (3.455)	0.006 (2.336)	0.013 (4.262)	0.007 (2.111)
Post carve-out	-0.065 (0.445)	0.106 (0.906)	0.015 (0.190)	-0.160 (1.42)	0.003 (0.095)	-0.127 (0.841)	-0.284 (3.003)	0.154 (1.277)	0.029 (0.205)
log Medi-Cal enrolled (ln_s_enr)	1.554 (1.616)	1.673 (1.693)	1.757 (1.601)	2.318 (2.047)	0.432 (0.915)	1.889 (1.828)	1.233 (2.220)	1.102 (1.776)	0.188 (0.199)
Percent PHP (pct2_php)	0.005 (0.463)	0.018 (4.431)	0.015 (2.693)	0.005 (0.863)	0.016 (2.187)	0.003 (0.379)	0.002 (0.305)	0.014 (1.468)	0.012 (1.473)
1995	0.021 (0.358)	0.024 (0.283)	0.020 (0.476)	-0.047 (1.143)	-0.007 (0.337)	0.436 (4.751)	-0.103 (2.074)	0.031 (0.493)	0.043 (0.621)
1996	0.152 (1.902)	-0.064 (0.817)	0.017 (0.350)	-0.096 (1.571)	-0.014 (0.427)	0.496 (4.270)	-0.052 (0.812)	-0.041 (0.504)	-0.077 (0.940)
1997	0.313 (2.692)	0.101 (1.787)	0.236 (2.248)	0.188 (1.959)	0.044 (0.956)	0.669 (3.833)	0.282 (3.641)	0.011 (0.104)	0.096 (0.840)
R squared	0.85	0.83	0.80	0.86	0.79	0.83	0.88	0.77	0.84

Each model includes 23 county and 3 season variables; the omitted county is Tulare County, the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.
N=1,104
[a] Can reject hypothesis that ln_s_enr = 1, p<0.05

Table 5.20B – Regression results for total children with CCS claims in diagnosis categories – Mandatory managed care aid categories in Two Plan and non-expansion counties (coefficients and absolute t statistics)

Variable	Total Children with Claim in Diagnosis Category							
	Digestive	Genitourinary	Musculo-skeletal	Congenital anomaly	Perinatal	Accident/Poisoning/Violence/IZ reaction	Other	Vcodes/Ecodes
Percent MCP (pct2cpli)	0.009 (3.070)	0.010 (4.162)	0.007 (2.673)	0.006 (2.904)	0.008 (2.499)	0.013 (4.346)	0.004 (2.523)	0.006 (2.535)
Post carve-out	0.018 (0.445)	0.139 (1.114)	0.032 (0.230)	-0.107 (1.408)	-0.175 (1.212)	-0.075 (0.640)	-0.001 (0.007)	-0.031 (0.384)
log Medi-Cal enrolled (ln_s_enr)	1.099 (1.363)	1.300 (1.657)	1.095 (1.805)	1.246 (2.216)	2.688 (2.005)	1.403 (1.881)	-0.118 (0.132)	2.548 (3.411)
Percent PHP (pct2_php)	0.001 (0.089)	0.014 (1.579)	-0.000 (0.038)	-0.004 (0.524)	-0.001 (0.200)	0.003 (0.350)	0.002 (0.413)	0.004 (0.836)
1995	-0.043 (0.592)	0.026 (0.350)	-0.122 (1.648)	-0.040 (0.870)	-0.099 (1.314)	0.025 (0.273)	0.106 (2.081)	0.015 (0.181)
1996	-0.046 (0.540)	0.079 (1.516)	0.011 (0.123)	0.121 (1.732)	-0.192 (1.935)	0.024 (0.307)	0.093 (1.362)	-0.116 (1.276)
1997	0.051 (0.620)	0.215 (2.083)	0.265 (2.295)	0.305 (3.061)	0.048 (0.329)	0.190 (1.604)	0.286 (2.176)	0.210 (1.580)
R squared	0.83	0.80	0.85	0.89	0.87	0.86	0.91	0.88

Each model includes 23 county and 3 season variables; the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.
N=1,104
[a] Can reject hypothesis that ln_s_enr = 1, $p < 0.05$

Table 5.21A – Regression results for total children with CCS claims in diagnosis categories – Non-mandatory managed care aid categories in Two Plan and non-expansion counties (coefficients and absolute t statistics)

Variable	Total Children with Claim in Diagnosis Category								
	Endocrine, nutritional, metabolic	Neoplasm	Infection	Blood	Psychiatric	Nervous system	Sensory system	Circulatory system	Respiratory
Percent MCP (pct2cpli)	0.059 (2.013)	0.096 (3.567)	0.062 (1.739)	0.063 (3.919)	0.101 (2.428)	0.004 (0.325)	0.041 (3.449)	0.127 (3.186)	0.065 (3.668)
Post carve-out	-0.061 (0.323)	-0.120 (0.821)	0.076 (0.404)	-0.138 (1.826)	-0.002 (0.012)	-0.079 (0.731)	-0.212 (3.459)	-0.038 (0.215)	0.039 (0.458)
log Medi-Cal enrolled (ln_s_enr)	1.608 (1.866)	4.929[a] (3.363)	0.757 (0.578)	2.349 (2.226)	-0.167 (0.141)	2.730 (1.604)	0.670 (0.683)	1.062 (1.028)	1.179 (0.779)
Percent PHP (pct2_php)	0.032 (1.064)	0.068 (1.674)	0.009 (0.320)	0.020 (0.759)	0.126 (2.047)	0.091 (2.516)	0.023 (1.762)	0.126 (3.175)	0.056 (1.181)
1995	-0.078 (1.508)	-0.182 (1.505)	0.061 (0.780)	-0.141 (2.117)	0.048 (0.713)	0.416 (3.450)	0.010 (0.155)	-0.054 (0.689)	0.005 (0.086)
1996	-0.096 (0.972)	-0.426 (2.827)	0.155 (1.233)	-0.155 (1.380)	0.145 (1.375)	0.470 (2.945)	0.149 (1.440)	0.018 (0.184)	-0.013 (0.130)
1997	0.108 (1.844)	-0.359 (1.647)	0.180 (1.186)	-0.083 (0.649)	0.213 (1.591)	0.697 (4.745)	0.396 (3.348)	-0.048 (0.375)	0.098 (0.856)
R squared	0.89	0.89	0.85	0.93	0.78	0.91	0.89	0.82	0.90

Each model includes 23 county and 3 season variables; the omitted county is Tulare County, the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.
N=1,104
[a] Can reject hypothesis that ln_s_enr = 1, p<0.05

Table 5.21B – Regression results for total children with CCS claims in diagnosis categories – Non-mandatory managed care aid categories in Two Plan and non-expansion counties (coefficients and absolute t statistics)

Variable	Total Children with Claim in Diagnosis Category							
	Digestive	Genitourinary	Musculo-skeletal	Congenital anomaly	Perinatal	Accident/ Poisoning/Violence/ IZ reaction	Other	Vcodes/ Ecodes
Percent MCP (pct2_cpli)	0.051 (1.841)	0.132 (6.159)	0.027 (1.762)	0.040 (2.646)	0.104 (2.760)	0.045 (2.615)	0.018 (1.929)	0.038 (2.103)
Post carve-out	-0.015 (0.122)	-0.194 (1.365)	0.007 (0.066)	-0.112 (1.510)	-0.146 (1.151)	-0.088 (0.768)	-0.100 (2.320)	-0.129 (1.610)
log Medi-Cal enrolled (ln_s_enr)	0.363 (0.275)	0.870 (0.669)	2.462 (1.977)	1.485 (1.560)	4.691 [a] (3.215)	3.407 (3.728)	0.375 (0.543)	2.624 (2.016)
Percent PHP (pct2_php)	0.059 (1.391)	0.097 (2.980)	-0.022 (0.887)	0.061 (3.140)	0.084 (1.108)	0.053 (2.393)	0.044 (3.657)	-0.031 (0.645)
1995	0.098 (1.306)	-0.107 (2.235)	0.014 (0.176)	0.061 (0.980)	-0.188 (1.686)	-0.086 (1.119)	-0.020 (0.331)	0.012 (0.114)
1996	0.150 (1.185)	-0.027 (0.212)	0.067 (0.407)	0.083 (0.933)	-0.388 (2.083)	-0.106 (0.995)	0.184 (2.332)	-0.041 (0.312)
1997	0.326 (2.056)	0.005 (0.038)	0.167 (0.871)	0.290 (2.754)	-0.320 (1.799)	0.067 (0.512)	0.436 (5.187)	0.093 (2.747)
R squared	0.89	0.87	0.87	0.92	0.87	0.89	0.96	0.90

Each model includes 23 county and 3 season variables; the omitted county is Tulare County, the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed. N=1,104

[a] Can reject hypothesis that ln_s_enr = 1, p<0.05

were significant at p<0.10 for the mandatory group (p=0.06 and p=0.00, respectively). For six (6) of the 17 diagnosis categories evaluated, the slopes were both significant or were both not different from zero, for the non-mandatory group. As expected based on the earlier results, it was the coefficient that was not significant when an association was found for only one coefficient. For the mandatory group, ten (10) of the 17 diagnosis categories produced either two significant slopes or showed no effect in both periods. As with the non-mandatory group, the carve-out period prior to default was generally where the slope was not significant.

For both mandatory and non-mandatory groups, year dummies for 1997 generally show increased claimant volume in addition to the increase associated with the carve-out. This indicates a statewide time trend of increasing claimants for these diagnosis categories that is independent of the rate of MCP participation. Categories for which the 1997 dummy did not reach p<0.10 for the mandatory group only were digestive and perinatal; for non-mandatory only were neoplasm, infection, blood-related, and genitourinary; and for neither mandatory nor non-mandatory groups, circulatory, respiratory, or psychiatric diagnoses.

The coefficient for Medi-Cal enrollment generally had a value that did not differ from one. The coefficient was statistically different from zero for few categories. PHP participation was associated with claimant volume in only few diagnosis categories for the mandatory and the non-mandatory groups. There was no consistent pattern for the mandatory and non-mandatory groups. As summarized earlier, the results for overall claimant volume (**Table 5.11**) generally had not indicated a consistent association between PHP participation and claimant volume in the mandatory group or claimant volume in the non-mandatory group.

5.5 Summary of Findings For "Case-Finding" Hypotheses

In general, the findings from multivariate analysis suggest that CCS claimant volume increased in Two Plan model counties due to the carve-out policy. Increased monthly claimant volume was found for the group of pooled non-mandatory aid categories as well as for the mandatory group of aid categories. A change in practices that affected both mandatory and non-mandatory groups may have caused at least some of the increase in CCS referrals and authorizations for children.

The primary hypotheses were that more children would be identified as CCS eligible and that more services would be identified as CCS related. The extent to which this occurs within a county was expected to be influenced by pre carve-out CCS and Medi-Cal authorization practices and also provider practices, as well as by the magnitude of their responses to the carve-out. Some counties may have identified more of the eligible population and had more of their services covered by CCS relative to other counties before the carve-out took place. If so, then the potential of carve-out impact to alter program participation is on average lower. There was variability across counties in the estimated effect. Claimant diagnosis information also suggested some baseline differences in the profile of program participants. The specific reasons for county differences are largely unknown although some of the variation may be explained by prevalence of health risks (e.g., violence affecting

adolescents), or by long-term family re-location to a county with specialized facility capacity due to a severe and chronic disease.

Some managed care expansion counties demonstrated increased monthly claimant volume and a smaller number of counties—all late-implementing Two Plan counties—revealed no claimant volume changes or a decline in monthly CCS claimants as MCP participation increased. The different managed care expansion counties may have varied in the volume of non-identified children with CCS-eligible medical diagnoses present in the county at the time that the carve-out policy was implemented. The effect of Medi-Cal Field Office changes in deferral of Treatment Authorization Requests (TARs) and CCS referral protocols may have taken place at different times relative to the carve-out and at different rates across counties. Any such programmatic changes that took place also are relevant for the non-expansion counties. This may explain why combined specifications of Two Plan and non-expansion counties indicated an overall statewide increase in CCS participation toward the end of the study period.

The carve-out impact estimates found for specific Medi-Cal aid eligibility groups involved less heterogeneity than that involved in the combined group specifications. Results were consistent with hypotheses. The largest cash assistance and non-cash assistance aid groups conferring Medi-Cal eligibility showed substantial effects for Two Plan and COHS counties. The effects were largest for the cash assistance aid category and lowest for the SSI aid category. This may be attributed to a different composition of mandatory and voluntary SSI beneficiaries and to low variability in the effect measure (MCP participation) values.

It was hypothesized that CCS program participation could increase overall for particular types of eligible children. Even if program participation did not increase significantly even within some diagnosis categories, it may have caused an expansion of services authorized by CCS for participants. This could cause a broader range of diagnosis categories to be "accessed" by program participants.

Overall, the findings suggest a general carve-out effect that extended across diagnosis categories. Possible explanations include the following: physician referral practices and health plan referral activities; Medi-Cal field office changes; changes to CCS authorization policies and procedures; and shifts in care type that extends care over longer periods of time and/or that results in claims having more variability in coding with respect to diagnosis. Evaluation of claimants by diagnosis category suggested particularly sizable carve-out impact across circulatory and genitourinary categories for both non-mandatory and mandatory groups. Other categories with largest impact within the mandatory group included endocrine/metabolic/nutritional, neoplasm, and a category of accident/violence. The results also suggest that the increase in monthly claimant volume is not exclusively attributable to CCS authorization changes in covering pharmaceuticals. A category comprised largely of beneficiaries with pharmacy claims showed a significant increase with MCP participation as well as a significant increase in CCS participation in 1997 relative to the baseline year. Claims for these services did not contribute to the diagnosis category claimant counts, and yet

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increased claimant counts (even controlling for Medi-Cal enrollment) were found across most diagnosis groups.

In summary, because these models adjust for total Medi-Cal enrollment and for annual changes, as well as for epidemiological patterns to the extent that these are captured in seasonal dummy variables, the results indicate increased CCS program participation associated with the carve-out across all diagnosis categories for the mandatory group. Most 1997 year dummies also were significant and positive, which indicates an independent time trend (in the Two Plan and non-expansion counties combined) of increased claimant volume. The fact that MCP participation was associated with increasing CCS participation while there was a declining time trend in some categories supports an independent effect. It may further indicate that it is the actual level of MCP participation—rather than a pre-post difference caused by the carve-out "shock", or level shift—that is associated with the observed CCS participation outcomes.

CHAPTER 6—IMPACT OF CARVE-OUT POLICY ON MEDICAID EXPENDITURES

This chapter includes findings for the following two questions. The first question is whether fee-for-service expenditures on CCS-authorized claims increased following the carve-out. It was hypothesized that the carve-out policy motivated providers to refer more potentially eligible children to CCS, and that this group of children would tend to be those who might not have been referred in the past and for whom CCS authorization could have been circumvented (with expenditures also being affected by an increased tendency to have more services authorized for children already known to CCS). To evaluate this hypothesis, the measure of expenditures per CCS claimant was used.

The carve-out effect may be concentrated among those children with lower monthly costs. Thus the second question was whether the volume of children with relatively low expenditures for CCS-authorized services increases with the carve-out.

Findings for changes in total CCS expenditures and in total expenditures per monthly CCS claimants are discussed together in **6.1** through **6.3**. The discussion of the second question is provided in section **6.4** with an analysis of changes in types of expenditures (i.e., provider types) provided in section **6.5**.

6.1   Descriptives for Total Expenditures on CCS-Authorized Claims

Annual averages of monthly CCS expenditures varied over the study period for most expansion and non-expansion counties. There was no common pattern of an increasing time trend. **Table 6.1, Mean monthly CCS expenditures in California counties, annually 1994-1997**, provides mean monthly figures on CCS expenditures by year for each county and managed care group. Most expansion counties showed some differences in mean expenditures over the study period. Two Plan counties that did not show significant variation in an overall test of equality of annual means ($F(3,44)$) for the mandatory group included Riverside, San Joaquin, and Tulare.

If the carve-out or other CCS program changes affected expenditures for CCS-authorized services in the counties, then higher monthly expenditures in 1997 relative to other years might be expected. Thus mean monthly expenditures for 1997 were compared to the means for 1994 and for 1995. A higher monthly average for 1997 was found (using Scheffe-adjusted significance levels) relative to 1994 and/or 1995 for the mandatory group in only two counties, Kern and Fresno. These are also the two counties that showed increasing claimant volume overall as well as across diagnosis categories. All other expansion counties revealed lower mean expenditures in 1997 or no change relative to earlier years.

Average 1997 monthly expenditures also were higher relative to 1994 and/or to 1995 for the non-mandatory groups in Fresno and Kern counties. In addition, the counties of Alameda, Orange, and San Joaquin showed higher expenditures in 1997.

Table 6.1 – Mean monthly CCS expenditures in California counties, annually 1994—1997

Model	County	Non-mandatory[a]					Mandatory[a]				
		1994	1995	1996	1997	p value	1994	1995	1996	1997	p value
MC expansion counties—Early implementing counties (4)											
2-plan	Alameda	$873,124	871,975	969,854	1,023,382	.01	1,401,197	1,191,182	1,107,936	1,184,735	.00
2-plan	Kern	$464,466	512,335	580,754	716,942	.00	582,308	667,743	804,064	867,344	.00
COHS	Orange [b]	$1,408,113	1,405,120	1,951,764	2,081,656	.00	1,342,556	1,247,402	1,269,944	1,087,954	.02
COHS	Santa Cruz [b]	$177,870	181,931	181,530	254,769	.01	164,045	143,032	182,109	158,238	.00
Other MC expansion counties (10)											
2-plan	Contra Costa	$464,839	386,648	413,074	417,022	.12	407,336	570,783	382,535	451,176	.00
2-plan	Fresno	$656,793	540,398	651,600	996,727	.00	762,691	613,828	715,060	962,412	.00
2-plan	Los Angeles	$8,705,469	8,856,127	9,462,354	9,399,461	.02	8,945,239	8,348,790	7,927,941	7,099,730	.00
2-plan	Riverside	$819,710	1,106,688	1,191,873	1,198,073	.00	929,825	862,219	906,100	860,778	.49
2-plan	San Bernardino	$1,461,454	1,596,998	1,620,371	1,696,751	.01	1,817,367	1,607,430	1,531,229	1,688,882	.01
2-plan	San Francisco	$433,252	410,585	466,411	512,292	.04	413,288	266,543	263,134	347,252	.00
2-plan	San Joaquin	$375,136	399,706	413,305	523,716	.00	521,092	430,258	488,978	406,673	.11
2-plan	Santa Clara	$863,566	960,949	962,444	725,833	.00	978,430	931,338	954,496	730,652	.00
2-plan	Stanislaus	$277,529	355,977	346,609	382,055	.01	370,203	460,590	528,508	350,668	.00
2-plan	Tulare	$283,002	250,249	360,318	370,248	.00	317,685	350,537	341,174	339,559	.76
Other MC expansion counties—Unique MC models (3)											
MCN	Placer	$20,462	50,620	70,341	63,492	.00	33,823	95,980	48,294	44,445	.01
GMC	San Diego	$1,593,045	1,658,045	1,719,691	1,663,105	.41	1,499,585	1,325,829	1,286,026	1,139,751	.00
MCN	Sonoma	$183,139	175,672	221,803	202,936	.39	194,432	152,253	133,636	140,536	.16
Other MC expansion counties—Not implementing CCS carve-out (5)											
COHS	Napa	$43,967	47,778	52,007	61,696	.67	17,650	77,247	34,475	34,323	.00
GMC	Sacramento	$494,698	521,735	585,521	789,246	.00	823,080	864,258	811,991	770,237	.31
COHS	San Mateo	$155,442	177,902	175,116	240,118	.00	107,491	138,774	146,598	153,336	.20
COHS	Santa Barbara	$123,895	162,907	168,786	193,572	.00	28,627	50,187	86,909	75,174	.07
COHS	Solano	$47,135	7,234	21,838	98,705	.00	96,947	14	2,944	71,840	.01
Non-MC expansion counties—With voluntary MC (3)											
—	Madera	$48,880	80,886	89,631	99,734	.00	61,145	121,687	102,468	94,686	.00
—	Marin	$65,849	91,117	98,657	49,094	.01	40,685	38,602	43,599	36,374	.95
—	Yolo	$47,040	53,434	55,461	72,977	.28	100,307	53,700	42,734	52,684	.00
Non-MC expansion counties (33)											
—	Alpine	$26	25	922	487	.09	36	20	20	9	.84

Model	County	Non-mandatory[a]					Mandatory[a]				
		1994	1995	1996	1997	p value	1994	1995	1996	1997	p value
—	Amador	$10,212	4,505	8,400	5,195	.39	9,388	7,811	17,071	4,831	.29
—	Butte	$93,475	85,327	121,660	147,736	.00	87,477	120,141	84,377	89,452	.19
—	Calaveras	$12,398	28,878	16,426	11,912	.11	5,208	17,307	3,139	23,143	.00
—	Colusa	$20,304	6,901	9,562	19,434	.01	21,143	39,762	9,276	13,150	.01
—	Del Norte	$16,442	15,735	10,096	12,299	.83	14,977	5,691	8,574	20,629	.10
—	El Dorado	$33,907	52,227	49,001	57,743	.24	38,534	9,835	29,593	72,565	.00
—	Glenn	$13,049	23,839	42,843	27,709	.00	10,965	11,122	34,328	4,064	.01
—	Humboldt	$77,277	49,955	87,873	109,591	.00	93,954	89,147	73,276	120,347	.32
—	Imperial	$168,437	151,567	222,718	250,248	.00	127,419	142,384	128,909	157,456	.59
—	Inyo	$1,266	1,598	8,619	7,345	.01	17,218	6,858	14,527	4,148	.09
—	Kings	$71,405	76,638	46,491	72,169	.16	58,349	78,272	103,832	79,346	.06
—	Lake	$28,902	38,927	32,409	39,003	.61	54,350	65,359	55,171	74,246	.78
—	Lassen	$2,564	8,499	9,860	11,567	.43	27,442	10,453	9,619	4,935	.00
—	Mariposa	$2,655	3,227	2,140	1,933	.93	2,231	766	5,898	7,004	.48
—	Mendocino	$53,670	58,393	53,068	51,594	.96	94,643	50,912	45,561	51,897	.01
—	Merced	$179,994	172,040	247,217	265,808	.00	181,258	229,083	186,721	174,009	.28
—	Modoc	$2,046	4,150	1,419	1,538	.38	1,763	0	2,459	9,035	.04
—	Mono	$7,187	6,788	2,590	178	.00	4,151	6,798	185	109	.23
—	Monterey	$305,327	391,572	390,807	401,613	.02	335,790	458,521	339,881	303,922	.01
—	Nevada	$18,268	26,144	66,683	35,396	.01	15,136	16,016	25,030	13,692	.21
—	Plumas	$533	422	3,022	10,293	.00	3,020	3,961	13,941	4,826	.44
—	San Benito	$28,705	15,564	25,288	30,161	.42	64,727	37,016	27,566	30,672	.05
—	San Luis Obispo	$99,541	112,747	122,536	143,436	.20	144,301	70,356	47,737	83,693	.35
—	Shasta	$39,804	75,304	75,544	79,038	.02	67,485	92,971	152,913	96,172	.00
—	Sierra	$765	1,944	782	146	.55	19	227	378	37	.62
—	Siskiyou	$7,441	14,712	7,693	15,751	.31	3,033	25,871	6,757	9,240	.26
—	Sutter	$23,913	45,381	44,825	38,218	.15	41,225	29,171	37,798	60,279	.17
—	Tehama	$11,290	14,627	24,147	20,773	.22	46,723	50,516	22,793	37,083	.08
—	Trinity	$2,560	5,434	15,317	19,071	.03	16,736	6,434	6,912	2,954	.45
—	Tuolomne	$24,443	24,822	28,431	19,826	.68	24,719	32,817	23,513	31,579	.81
—	Ventura	$282,256	309,955	269,446	291,648	.16	297,246	272,337	191,527	147,081	.00
—	Yuba	$24,292	21,003	15,378	29,441	.18	48,401	58,806	40,091	64,747	.30

[a] Mandatory managed care group status uses definition in place for Two Plan counties.

[b] Using COHS county definition of mandatory group, annual monthly means are as follows for the two COHS expansion counties. For Orange, non-mandatory means were $654,767 (1994), $643,574 (1995), $715,530 (1996), $694,371 (1997), p=0.00 (F(3,44)) and mandatory means were $2,095,903 (1994), $2,008,949 (1995), 2,506,178 (1996), 2,475,239 (1997), p=0.54 (F(3,44)). For Santa Cruz, non-mandatory means were $75,286 (1994), $61,844 (1995), $41,163 (1996), $66,712 (1997), p=0.11 (F(3,44)) and mandatory means were $266,630 (1994), $263,119 (1995), $322,476 (1996), $346,294 (1997), p=0.03 (F(3,44)).   p value for test of equality of means F(3,44)

Table 6.2, Mean monthly expenditures per CCS claimants in California counties, annually 1994-1997, provides mean monthly figures on CCS expenditures per total monthly claimants by year for each county and managed care group. In the two counties (Kern and Fresno) that showed significant increases in both claimant volume and total CCS expenditures for the mandatory group in 1997 relative to earlier years, a time trend of declining expenditures per claimants was evident, as expected. Lower values in 1997 relative to 1994 and/or 1995 were also found for Alameda, Orange, Contra Costa, and San Joaquin. If there is a pre-post difference, then significant differences may be found in different years. For the two COHS counties fully implemented by January 1996, monthly values were lower in 1996 relative to 1995 for Orange, but the difference was not significant for Santa Cruz. For the non-mandatory group, only San Bernardino and Santa Clara had lower mean monthly expenditures in 1997 relative to 1995.

Thus the expenditure time trends do not indicate a general increase in expenditures across the expansion counties. If plausible expenditure declines due to changing modes of health care delivery are substantial, this effect could dominate a pre-post comparison whether or not there is an independent carve-out effect of increased expenditures. A larger number of counties, though still relatively few, showed lower expenditures per claimants in the later study period.

6.2 Multivariate Analysis for Total CCS Expenditures

Multivariate specifications using a pre-post measure and a continuous MCP measure as an indicator of exposure to carve-out incentives are used. If the exogenous shock is the dominant effect, then a pre-post indicator for the carve-out effect is most appropriate. If the incremental (direct exposure) effect dominates, then a continuous measure of MCP participation is most appropriate as a proxy for children's exposure to the carve-out incentives. Results from the pre-post specification are presented first, for the outcomes of total monthly expenditures and of expenditures per total claimants. This is followed by results from the continuous MCP measure specification for both outcomes of interest.

The monthly expenditure outcomes are specified as a function of monthly Medi-Cal enrollment, of percent voluntary participation in pre-carve-out PHPs, of year and seasonal effects, and of the carve-out measure.

6.2.1 Expenditures and Expenditures Per Total Claimants: Two Plan Counties

As with the analyses of claimant volume, separate regressions of expenditures were constructed for the mandatory group and for the non-mandatory group (**Table 6.3**).[72] The carve-out effect is captured by the "post" term in Model 1 and by two post carve-out indicators in Model 2. The coefficient for the "post" variable in the mandatory group was 0.047, which was in the hypothesized direction but not statistically significant. When the year dummies (which were all found independently not to be significant in the model) were constrained to be zero, the coefficient for the

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[72] As in the claimant volume models, the independent variables used in most specifications include log (Medi-Cal enrollment), log (percent PHP enrollment plus one), 3 seasonal dummies, 3 year dummies, and county fixed effects.

Table 6.2 – Mean monthly expenditures per CCS claimants in California counties, annually 1994—1997

Model	County	Non-mandatory [a]					Mandatory [a]				
		1994	1995	1996	1997	p value	1994	1995	1996	1997	p value
MC expansion counties—Early implementing counties (4)											
2-plan	Alameda	$3,097	2,511	2,568	2,228	.00	7,381	6,026	5,011	4,363	.00
2-plan	Kern	$3,110	3,257	3,172	2,840	.30	6,387	6,452	5,816	3,982	.00
COHS	Orange [b]	$2,164	2,367	2,298	2,228	.43	4,088	4,439	2,749	2,172	.00
COHS	Santa Cruz [b]	$2,401	1,818	1,429	1,862	.00	3,355	2,666	2,191	1,660	.00
Other MC expansion counties (10)											
2-plan	Contra Costa	$3,306	2,326	2,314	2,289	.00	7,299	7,353	5,324	4,283	.00
2-plan	Fresno	$2,077	1,891	2,115	2,292	.05	5,605	5,112	5,484	3,502	.00
2-plan	Los Angeles	$2,584	2,415	2,365	2,257	.00	4,029	3,828	3,736	3,764	.08
2-plan	Riverside	$2,715	2,685	2,657	2,485	.35	5,191	4,757	5,047	4,338	.04
2-plan	San Bernardino	$3,071	2,683	2,211	2,052	.00	5,295	5,049	4,852	5,090	.36
2-plan	San Francisco	$2,437	2,309	2,380	2,107	.32	4,620	3,068	3,349	3,289	.00
2-plan	San Joaquin	$2,194	1,884	1,797	1,917	.19	6,035	4,345	4,186	2,838	.00
2-plan	Santa Clara	$3,068	2,823	2,733	2,287	.00	5,549	4,542	5,164	4,113	.00
2-plan	Stanislaus	$2,277	1,810	1,748	1,924	.04	6,023	4,011	6,785	4,191	.00
2-plan	Tulare	$2,059	1,731	2,326	2,111	.03	4,247	4,419	4,364	3,765	.15
Other MC expansion counties—Unique MC models (3)											
MCN	Placer	$1,120	1,807	1,908	1,837	.15	2,894	5,715	2,515	2,602	.01
GMC	San Diego	$3,059	2,178	2,119	1,854	.00	5,107	4,107	4,263	2,904	.00
MCN	Sonoma	$2,318	1,613	1,809	1,533	.04	4,473	3,407	3,073	3,270	.00
Other MC expansion counties—Not implementing CCS carve-out (5)											
COHS	Napa	$1,921	1,545	1,311	1,161	.31	2,138	7,339	3,107	4,369	.00
GMC	Sacramento	$1,616	1,297	1,200	1,477	.00	3,691	3,157	2,533	2,305	.00
COHS	San Mateo	$1,422	1,143	1,196	1,477	.04	1,395	1,515	1,449	1,392	.93
COHS	Santa Barbara	$1,511	1,498	1,229	1,125	.65	346	597	900	854	.12
COHS	Solano	$3,447	2,793	3,932	864	.34	3,291	8	2,192	1,555	.27
Non-MC expansion counties—With voluntary MC (3)											
—	Madera	$1,999	3,150	3,399	2,788	.01	3,821	7,127	5,842	4,618	.00
—	Marin	$2,430	2,855	2,786	1,366	.01	2,838	2,618	2,474	1,793	.48
—	Yolo	$1,869	1,480	1,489	1,553	.66	5,083	3,520	2,737	1,955	.00
Non-MC expansion counties (33)											
—	Alpine	$26	25	922	487	.00	36	20	11	9	.77
—	Amador	$2,730	1,816	2,090	911	.00	4,556	2,899	9,507	1,238	.08
—	Butte	$1,400	1,159	1,394	1,296	.00	3,704	4,272	2,940	2,340	.00
—	Calaveras	$2,127	4,000	2,247	1,571	.06	1,187	3,316	930	7,567	.00
—	Colusa	$4,916	1,553	1,211	3,877	.00	8,883	11,873	3,439	2,777	.00
—	Del Norte	$3,529	2,521	1,962	6,189	.67	4,342	3,017	3,619	7,746	.19
—	El Dorado	$2,624	3,481	2,093	1,948	.00	4,741	1,774	2,333	4,226	.00
—	Glenn	$1,688	2,732	2,743	1,813	.00	2,172	2,117	6,661	618	.01
—	Humboldt	$2,148	1,562	2,525	2,472	.00	4,383	4,534	3,547	6,017	.24
—	Imperial	$4,786	3,800	4,991	4,776	.00	4,468	5,009	4,452	5,088	.81
—	Inyo	$827	1,170	3,717	2,359	.00	9,604	5,063	9,537	1,924	.21
—	Kings	$4,171	3,685	2,619	3,633	.06	5,783	5,984	6,796	4,847	.36
—	Lake	$2,489	2,759	1,872	1,869	.00	5,315	4,345	6,380	4,830	.73
—	Lassen	$762	2,821	2,221	1,833	.00	10,847	7,100	3,128	1,016	.00
—	Mariposa	$2,607	1,721	1,153	1,229	.30	1,253	462	5,401	3,742	.35

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Model	County	Non-mandatory [a]					Mandatory [a]				
		1994	1995	1996	1997	p value	1994	1995	1996	1997	p value
—	Mendocino	$1,893	1,813	1,790	1,404	.00	6,275	3,113	2,543	2,390	.00
—	Merced	$2,743	1,953	2,281	2,116	.00	5,060	4,450	3,477	2,894	.00
—	Modoc	$1,630	2,535	529	924	.00	1,429	0	1,553	8,616	.04
—	Mono	$5,587	4,335	2,192	107	.02	3,550	3,671	158	109	.20
—	Monterey	$3,434	3,265	2,906	3,163	.00	4,686	5,495	4,797	4,522	.33
—	Nevada	$1,515	2,015	4,491	1,562	.00	2,358	2,958	2,906	1,455	.16
—	Plumas	$533	416	1,422	3,263	.00	1,900	2,292	4,760	1,184	.58
—	San Benito	$3,022	1,608	1,620	1,843	.00	8,106	4,409	3,880	5,143	.09
—	San Luis Obispo	$1,815	1,309	1,304	1,374	.00	4,413	2,082	1,360	2,531	.00
—	Shasta	$1,150	1,389	1,203	1,061	.00	4,998	4,775	5,661	3,523	.11
—	Sierra	$765	1,916	692	126	.49	19	227	378	37	.62
—	Siskiyou	$925	2,288	947	1,494	.01	1,329	5,813	1,405	1,295	.37
—	Sutter	$1,859	3,938	2,268	1,580	.00	5,024	3,667	3,257	4,083	.76
—	Tehama	$1,329	1,308	1,533	1,182	.00	5,854	5,785	2,784	3,479	.02
—	Trinity	$1,042	1,347	2,313	3,262	.00	9,434	5,362	2,201	2,930	.42
—	Tuolomne	$2,986	2,136	2,477	1,896	.03	3,230	5,989	5,208	5,866	.58
—	Ventura	$2,069	1,567	1,213	1,251	.00	5,372	4,248	3,121	2,499	.00
—	Yuba	$1,638	1,599	1,002	1,401	.00	3,529	6,288	2,738	4,624	.01

[a] Mandatory managed care group status uses definition in place for Two Plan counties.
[b] Using COHS county definition of mandatory group, annual monthly means are as follows for the two COHS expansion counties. For Orange, non-mandatory means were $3,108 (1994), $4,925 (1995), $4,096 (1996), $3,550 (1997), p=0.00 (F(3,44)) and mandatory means were $2,926 (1994), $2,701 (1995), $2,197 (1996), $1,996 (1997), p=0.00 (F(3,44)). For Santa Cruz, non-mandatory means were $4,623 (1994), $4,004 (1995), $2,530 (1996), $3,449 (1997), p=0.11 (F(3,44)) and mandatory means were $2,499 (1994), $1,898 (1995), $1,667 (1996), $1,617 (1997), p=0.00 (F(3,44)).
p value for test of equality of means F(3,44)

carve-out policy effect increased to 0.07 but still did not reach statistical significance (p=0.24) (data not shown). This indicates that the inclusion of year dummies in the model did not mask a carve-out effect on expenditures; allowing the post carve-out indicator to capture a general time trend did not produce a significant effect. The coefficient was higher for the post default period when two post indicators were used (Model 2), but neither coefficient was significant. Taken together, these results show that total monthly CCS expenditures did not increase for the mandatory aid categories in the Two Plan model counties between the pre and post periods. The covariate of Medi-Cal enrollment was associated with total expenditures for the mandatory group, as expected. The hypothesis that a one percent increase in Medi-Cal enrollment is associated with a one percent increase in CCS expenditures could not be rejected. Coefficients for PHP participation had negative signs but were not significant. This suggests little effect of PHP participation on monthly expenditures.

The coefficient for the "post" variable in the regression for the non-mandatory group was −0.013 and also not statistically significant. Year dummies were not independently statistically significant. In the specification that constrained the year dummies to be zero, the coefficient for the carve-out policy effect increased to 0.08 although was still not statistically significant (p=0.27) with a 95 percent confidence interval of (−0.07, 0.24) (data not shown). Using two post indicators did not uncover a significant effect for either post carve-out period. As in the mandatory group, Medi-Cal enrollment

Table 6.3 – Pre and post carve-out total CCS expenditures, using post indicators – Two Plan model counties, by mandatory managed care group

Variable	Pre-post indicators				Difference-in-difference	
	Non-mandatory aidcodes		Mandatory aidcodes			
	(1)	(2)	(1)	(2)	(3)	(4)
Post carve-out indicator (post)	-0.013 (0.218)	---	0.047 (0.840)	---	0.037 (0.791)	---
Post carve-out with default (post2_a)	---	0.035 (0.336)	---	0.099 (1.032)	---	0.025 (0.270)
Post carve-out, no default (post1_a)	---	-0.026 (0.465)	---	0.033 (0.624)	---	0.057 (1.274)
Post carve-out, no default, & mandatory group (af_p1)	---	---	---	---	---	-0.140 (2.345)
Post carve-out with default, & mandatory group (af_p2)	---	---	---	---	---	-0.056 (0.818)
Mandatory group indicator (affect)	---	---	---	---	-0.268 (2.735)	-0.289 (2.995)
Post carve-out & mandatory group (af_p)	---	---	---	---	-0.096 (2.267)	---
Log Medi-Cal enrolled (ln_s_enr)	1.818 (2.477)	1.931 (2.985)	1.361 (3.049)	1.419 3.346)	0.402 [a] (3.843)	0.420 [a] (4.197)
Percent PHP (pct2_php)	0.026 (1.395)	0.030 (1.458)	-0.005 (1.199)	-0.004 (0.828)	-0.008 (2.063)	-0.008 (1.815)
1995	-0.054 (1.406)	-0.060 (1.662)	-0.040 (0.748)	-0.043 (0.784)	-0.010 (0.275)	-0.011 (0.305)
1996	-0.026 (0.395)	-0.038 (0.565)	-0.023 (0.344)	-0.026 (0.393)	0.048 (1.007)	0.046 (0.972)
1997	0.102 (1.186)	0.070 0.815)	0.034 (0.476)	0.012 (0.166)	0.087 (2.012)	0.083 (1.832)
N	576	576	576	576	1,152	1,152
R squared	0.96	0.96	0.93	0.93	0.94	0.94

(1) Uses one post carve-out indicator
(2) Uses indicators for post carve-out (no default) and post carve-out (default)
(3) Uses post carve-out indicator, interaction with mandatory group, and mandatory group main effect
(4) Uses 2 post carve-out indicators, interactions with mandatory group, and mandatory group main effect
Each model includes 11 county and 3 season dummy variables; the omitted county is Tulare County, and the omitted season is Jan-Mar; in the specification with year dummies, the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.   [a] Can reject hypothesis that ln_s_enr = 1, $p < 0.05$

was associated with increased expenditures, and PHP participation did not appear to affect monthly expenditures.

The difference-in-differences specifications (Models 3 and 4) did not show a post carve-out increase in expenditures for the mandatory group relative to the non-mandatory group. In fact, post carve-out expenditures fell in the mandatory group relative to the non-mandatory group (Model 3). Using two post carve-out interactions to further explore the trend showed that the initial carve-out months were where the difference was concentrated with a non-significant coefficient for the second interaction term (Model 4). In summary, the pre-post comparisons in Two Plan counties show that monthly expenditures did not increase significantly between the pre and post periods for the mandatory group or for the non-mandatory group.

Results for expenditures per total claimants are presented in **Table 6.4, Pre and post carve-out total CCS expenditures per claimants, using post indicators—Two Plan model counties, by mandatory managed care group**. Earlier multivariate pre-post comparisons for Two Plan model counties identified marginal or no increase in claimant volume for the post carve-out period. Coupled with the finding of no overall increase in total monthly expenditures, expenditures per total CCS claimants might be expected to have declined. The year dummies for the mandatory group did suggest an ongoing time trend of reduced expenditures per total claimants (all were independently significant at p<0.10) (Models 1 and 2). Mean monthly expenditures per claimants were not statistically different for the post carve-out period. Use of two post carve-out indicators identified a post carve-out decline that was concentrated in the post default period (decline of 22 percent) (Model 2). No post carve-out differences were found for the non-mandatory group. As a result, expenditures per claimant did fall in the post default period in the mandatory group relative to the non-mandatory group when two post indicators were used (Model 4), although the difference-in-differences model did not produce a statistically significant interaction term when a single post carve-out indicator was used (Model 3).

The covariate of Medi-Cal enrollment generally was not associated with total expenditures per claimants. There was no hypothesis for how total Medi-Cal enrollment might affect expenditures per claimants. Coefficients for PHP participation had negative signs but were not significant. This suggests little effect of PHP participation on monthly expenditures per claimants.

Model Specification with Continuous Carve-out Effect Measure

As with the claimant volume models, the next set of multivariate specifications uses a continuous variable of percent participation in post carve-out managed care.

Table 6.5, Regression results for CCS expenditures, and expenditures per claimants—Two-plan model counties, provides regression results separately for the mandatory managed care group and the non-mandatory group in Two Plan model counties. In general, the findings for the mandatory group were consistent with the results for the pre-post comparisons. For the mandatory group, the results show that total CCS expenditures did not increase as rates of managed care participation grew.

Table 6.4 – Pre and post carve-out total CCS expenditures per claimants, using post indicators – Two Plan model counties, by mandatory managed care group

Variable	Pre-post indicators				Difference-in-difference	
	Non-mandatory aidcodes		Mandatory aidcodes			
	(1)	(2)	(1)	(2)	(3)	(4)
Post carve-out indicator (post)	-0.041 (0.653)	---	-0.037 (0.511)	---	0.009 (0.166)	---
Post carve-out with default (post2_a)	---	-0.064 (0.803)	---	-0.250 (3.368)	---	0.046 (0.726)
Post carve-out, no default (post1_a)	---	-0.034 (0.543)	---	0.017 (0.271)	---	-0.012 (0.195)
Post carve-out, no default, & mandatory group (af_p1)	---	---	---	---	---	0.008 (0.100)
Post carve-out with default, & mandatory group (af_p2)	---	---	---	---	---	-0.215 (2.776)
Mandatory group indicator (affect)	---	---	---	---	0.513 (7.544)	0.585 (6.174)
Post carve-out & mandatory group (af_p)	---	---	---	---	-0.103 (1.594)	---
Log Medi-Cal enrolled (ln_s_enr)	0.104[a] (0.155)	0.050 (0.074)	-0.152[a] (0.569)	-0.388[a] (1.332)	0.247[a] (4.055)	0.199[a] (2.230)
Percent PHP (pct2_php)	-0.006 (0.398)	-0.008 (0.533)	-0.000 (0.056)	-0.006 (0.917)	-0.004 (0.740)	-0.007 (1.199)
1995	-0.133 (3.665)	-0.131 (3.862)	-0.163 (3.060)	-0.154 (2.917)	-0.148 (4.352)	-0.144 (4.173)
1996	-0.106 (1.331)	-0.100 (1.309)	-0.126 (1.851)	-0.113 (1.638)	-0.111 (2.283)	-0.105 (2.236)
1997	-0.142 (1.491)	-0.127 (1.391)	-0.335 (3.736)	-0.245 (3.562)	-0.224 (3.869)	-0.167 (3.245)
N	576	576	576	576	1,152	1,152
R squared	0.41	0.41	0.41	0.44	0.74	0.75

(1) Uses one post carve-out indicator
(2) Uses indicators for post carve-out (no default) and post carve-out (default)
(3) Uses post carve-out indicator, interaction with mandatory group, and mandatory group main effect
(4) Uses 2 post carve-out indicators, interactions with mandatory group, and mandatory group main effect
Each model includes 11 county and 3 season dummy variables; the omitted county is Tulare County, and the omitted season is Jan-Mar; in the specification with year dummies, the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.
[a] Can reject hypothesis that ln_s_enr = 1, $p < 0.05$

Table 6.5 – Regression results for CCS expenditures, and expenditures per claimants – Two-plan model counties (coefficients and t statistics)

Variable	Dependent variable							
	OLS for log(expenditures)				OLS for log(expenditures per claimants)			
	Non-mandatory		Mandatory		Non-mandatory		Mandatory	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Percent MCP (pct2cpli)	0.029 (2.235)	---	0.002 (1.236)	---	0.002 (0.184)	---	-0.005 (7.974)	---
Indicator for post carve-out (post)	-0.078 (1.143)	---	0.007 (0.121)	---	-0.046 (0.689)	---	0.081 (1.082)	---
Percent MCP, with default (p2_cpli)	---	0.051 (2.868)	---	0.001 (0.520)	---	0.024 (1.683)	---	-0.005 (6.111)
Indicator for post default (post2_a)	---	-0.223 (1.576)	---	0.046 (0.414)	---	-0.195 (1.940)	---	0.098 (0.915)
Percent MCP, no default (p1_cpli)	---	0.001 (0.038)	---	0.003 (2.509)	---	-0.021 (0.846)	---	-0.000 (0.145)
Indicator for post, no default (post1_a)	---	-0.007 (0.087)	---	-0.025 (0.393)	---	0.018 (0.225)	---	0.001 (0.010)
log Medi-Cal enrolled (ln_s_enr)	1.657 (2.531)	1.652 (3.227)	1.467 (3.726)	1.437 (3.326)	0.091 (0.133)	0.046 (0.070)	-0.466[a] (1.746)	-0.552[a] (1.636)
Percent PHP (pct2_php)	0.041 (1.918)	0.042 (1.817)	-0.004 (1.013)	-0.004 (1.003)	-0.005 (0.268)	-0.004 (0.219)	-0.003 (0.579)	-0.004 (0.775)
1995	-0.052 (1.455)	-0.052 (1.437)	-0.042 (0.776)	-0.042 (0.777)	-0.133 (3.641)	-0.132 (3.973)	-0.158 (2.995)	-0.156 (2.976)
1996	-0.027 (0.385)	-0.028 (0.410)	-0.025 (0.375)	-0.025 (0.383)	-0.106 (1.322)	-0.104 (1.364)	-0.120 (1.835)	-0.119 (1.778)
1997	0.044 (0.437)	0.057 (0.618)	-0.002 (0.022)	-0.005 (0.060)	-0.147 (1.571)	-0.130 (1.451)	-0.229 (3.295)	-0.229 (3.510)
R squared	0.96	0.96	0.93	0.93	0.41	0.42	0.45	0.46

Each model also includes 11 county and 3 season dummy variables; the omitted county is Tulare County, the omitted year is 1994, and the omitted season is Jan-Mar. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.
N=576
[a] Can reject hypothesis that ln_s_enr = 1, $p < 0.05$

Thus while there was a significant impact of the carve-out on CCS program participation, there was not a concomitant increase in monthly expenditures. The coefficients for the year dummies show that there was not a significant annual time trend in monthly CCS expenditures for Two Plan counties during the study period.

Continuing with the results for the mandatory group, monthly Medi-Cal enrollment was associated with increased expenditures. A one percent increase in expenditures given a one percent increase in Medi-Cal enrollment could not be rejected. Participation in PHPs prior to the carve-out did not appear to affect CCS expenditures in the mandatory group. As with the claimant volume results, the regression findings are consistent with an explanation that few children with CCS eligible medical diagnoses participated in the PHPs, and/or with an explanation that children in PHPs with such diagnoses would not have been incurring significant CCS-related costs had they been in the fee-for-service system (the selection hypothesis).

Table 6.5 also provides regression results for the non-mandatory managed care groups in the Two Plan model counties. Unlike the mandatory group, a statistically significant effect of managed care participation on expenditures was found (Model 1). When the initial and the post default periods were evaluated separately, the effect appeared to be concentrated in the post default period (coefficient of 0.051) with no effect in the initial months (coefficient of 0.001). The year dummies show no time trend in CCS expenditures.

Findings for total monthly Medi-Cal enrollment were similar. The hypothesis that a one percent increase in Medi-Cal enrollment causes a one percent increase in CCS participation could not be rejected. The findings for PHP participation differed from the mandatory managed care group. The coefficient of 4.48 was statistically significant and suggested that increased PHP participation was associated with an increase in CCS expenditures. This is not consistent with the hypothesis that the participation of Medi-Cal eligibles in prepaid health plans did not alter CCS program participation. It is possible that this variable is picking up a time trend rather than representing participation of CCS eligible children in PHPs. It is similar to the findings for claimant volume.

Why would expenditures increase with MCP participation in the non-mandatory group but not in the mandatory group? Earlier analysis of time trends had indicated increasing claimant volume (**Figure 5.2**) and expenditures (**Table 6.1**) for the non-mandatory group over the study period, even before the carve-out took effect. One possibility is that the managed care participation variable is picking up this independent time trend rather than an actual carve-out effect. The fact that the coefficients for year dummies were not statistically significant for the non-mandatory group tends to support this explanation. However, Medi-Cal enrollment also increased for the non-mandatory group in some counties (**Table 5.2**). The coefficient for Medi-Cal enrollment may be (appropriately) picking up the part of the time trend explained by the beneficiary increase. Another possibility is that the carve-out affected a different group of children, different services, or different expenditure patterns in the non-mandatory group than those affected in the mandatory group. This is plausible because the beneficiary composition certainly differs between the groups. These competing explanations underscore the importance of evaluating expenditure changes relative to those in the non-expansion

counties (discussed in a following section). Unfortunately, the lack of real comparability between the expansion and non-expansion counties makes definitive conclusions difficult.

Table 6.5 also provides results for CCS expenditures per total claimants in Two Plan model counties. There was a decline associated with increased MCP participation for the mandatory group (Model 1). The slope appeared to be zero in the initial carve-out months whereas the slope in the post default months was decidedly negative (Model 2). The coefficients for the year dummies show a general downward trend in total monthly CCS expenditures per claimants during the study period, relative to the baseline year (1994). The coefficient for total monthly Medi-Cal indicated a trend toward lower per claimant expenditures as Medi-Cal enrollment increased. Participation in PHPs prior to the carve-out did not appear to affect total CCS expenditures per claimants. A significant, negative coefficient for PHP participation would have indicated a lower cost "case-mix" in the fee-for-service system, given increased PHP participation (the opposite of what was hypothesized).

Managed care participation rates were not associated with expenditures per CCS claimants for the non-mandatory group. A trend toward a negative slope in the post default period was not significant (p=0.12) (Model 2). Monthly expenditures per CCS claimants in the non-mandatory group did not appear to be affected by Medi-Cal enrollment or by PHP participation. The latter finding is consistent with the hypothesis that pre carve-out participation in prepaid health plans did not significantly alter the "case-mix" (as it related to average costs) of CCS claimants.

Sensitivity to model specification

Summary findings for the continuous specification in Two Plan counties are presented in the first row of **Table 6.6, Sensitivity of MCP coefficients to alternate specifications, total expenditures and expenditures per total claimants—Two Plan Model counties**. The focus was on sensitivity of the results to inclusion of the PHP variable and to inclusion of late implementing expansion counties. If PHPs did have sustained enrollment of children with CCS eligible medical diagnoses, then total fee-for-service expenditures would be lower during months with PHP participation, all things equal. Thus ignoring PHP participation could cause the coefficient for MCP participation to be higher, signifying a higher increase in expenditures than was actually attributable to the carve-out policy. (If participation was low and/or these children had relatively low health care costs associated with their CCS eligible medical diagnosis(es), the characteristics of the fee-for-service CCS population could be unaffected with respect to costs.)

With respect to expenditures, the managed care participation coefficient in the mandatory group generally was not sensitive to specification changes, although the standard error increased when late implementing counties were dropped. The coefficient for expenditures per claimants changed little. For the non-mandatory group, the standard error increased when PHP participation was constrained to be zero. The carve-out coefficient was significant with or without the late implementing counties. The coefficient was sensitive to inclusion of county fixed effects for the outcome of expenditures per claimants, but this is not the preferred model and does not affect earlier conclusions about this outcome.

Table 6.6 – Sensitivity of MCP coefficients to alternate specifications, total expenditures and expenditures per total claimants— Two Plan model counties

Specification	Dependent variable			
	OLS for log(expenditures)		OLS for log(expenditures per total claimants)	
	Non-mandatory	Mandatory	Non-mandatory	Mandatory
All twelve (12) 2-plan counties (n=576) with PHP variable	0.029 (2.235)	0.002 (1.236)	0.002 (0.184)	-0.005 (7.974)
All twelve (12) 2-plan counties(n=576) without PHP variable	0.020 (1.399)	0.002 (1.53)	0.003 (0.307)	-0.005 (6.747)
All twelve (12) 2-plan counties (n=576) with PHP variable no county fixed effects	0.024 (2.145)	0.003 (2.093)	0.015 (1.516)	-0.003 (3.412)
All twelve (12) 2-plan counties (n=576) without PHP variable no county fixed effects	0.018 (1.887)	0.002 (1.715)	0.014 (1.311)	-0.003 (3.145)
Four (4) late implementing counties deleted (n=384) with PHP variable	0.038 (2.438)	-0.000 (0.216)	-0.011 (0.785)	-0.004 (5.085)
Four (4) late implementing counties deleted (n=384) without PHP variable	0.025 (1.458)	-0.000 (0.792)	0.008 (0.661)	-0.004 (5.392)

Each model includes a post carve-out (0,1) indicator, 3 year dummies, and 3 season dummy variables; the omitted county is Tulare County, the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors with assumption of independence within groups (county) relaxed. Models with 12 counties have 576 observations, and models with 8 counties have 384 observations.

Individual Two Plan Counties

Multivariate specifications also were evaluated for individual counties. The county-specific models are provided in **Table 6.7, Regression results for total CCS expenditures in Two Plan model counties, by county**, ordered by the date that the county first enrolled beneficiaries into the Two Plan model.

Table 6.7 – Regression results for total CCS expenditures in Two Plan Model counties, by county

County	Dependent variable=log(expenditures)							
	Non-mandatory				Mandatory			
	(1)		(2)		(1)		(2)	
	Percent MCP pct2cpli	Percent MCP pct2cpli	Percent PHP pct2_php	Medi-Cal enrolled ln_s_enr	Percent MCP pct2cpli	Percent MCP pct2cpli	Percent PHP pct2_php	Medi-Cal enrolled ln_s_enr
Alameda	-0.033 (1.302)	-0.166 (2.389)	-0.883 (2.045)	-1.577 (0.522)	-0.000 (0.273)	-0.002 (0.449)	-0.107 (0.371)	-0.831 (0.609)
Kern	---	0.051 (1.481)	---	4.504 (2.491)	---	0.006 (1.422)	---	2.316 (1.281)
Contra Costa	0.050 (1.042)	0.183 (1.795)	0.265 (1.471)	5.880 (1.252)	0.000 (0.063)	-0.003 (0.402)	-0.040 (0.633)	2.248 (0.503)
Fresno	---	-0.030 (1.100)	---	-4.770 (1.584)	---	0.000 (0.147)	---	-7.099 [a] (3.352)
San Francisco	-0.008 (0.189)	-0.034 (0.320)	-0.082 (0.269)	-4.792 (0.913)	-0.005 (1.151)	0.011 (1.069)	0.109 (1.711)	-3.173 (0.889)
San Joaquin	0.115 (2.610)	0.114 (2.535)	-0.108 (0.250)	-0.722 (0.143)	0.004 (0.837)	0.004 (1.117)	-1.198 (3.013)	6.564 (1.297)
Santa Clara	-0.039 (0.753)	0.066 (0.693)	0.338 (1.317)	-0.694 (0.216)	-0.007 (3.041)	-0.006 (2.100)	0.024 (0.299)	0.099 (0.078)
Los Angeles	0.006 (0.350)	-0.412 (2.982)	-0.361 (2.957)	3.697 [a] (3.143)	0.001 (0.485)	-0.000 (0.003)	-0.001 (0.084)	-0.846 [a] (1.012)
Stanislaus	---	-0.000 (0.005)	---	3.295 (1.042)	---	0.001 (0.302)	---	0.908 (0.286)
Riverside	-0.352 (1.819)	-0.533 (2.695)	-0.394 (2.374)	-2.533 (1.034)	0.014 (1.414)	0.011 (0.721)	0.013 (0.177)	1.215 (0.570)
San Bernardino	-0.112 (1.199)	-0.142 (1.107)	-0.036 (0.348)	0.175 (0.064)	0.038 (3.781)	0.040 (3.912)	-0.043 (1.073)	7.835 [a] (2.921)
Tulare	---	---	---	5.355 (1.420)	---	---	---	2.284 (1.012)

For each model, n=48 and includes a post carve-out indicator (0,1) and 3 year and 3 season dummies. The t statistics use White-corrected standard errors. Several counties have only Commercial Plan(s) or Local Initiative plans; Tulare County did not implement Medi-Cal managed care during the study period.
(1) Model without PHP enrollment variable (for counties that had PHP contracts)
(2) Model includes PHP enrollment variable
[a] Can reject ln_s_enr=1, $p<0.05$

As discussed in the previous section, the preliminary estimate for the carve-out impact on CCS expenditures was that increased MCP participation in Two Plan counties corresponded to increased expenditures in the non-mandatory but not in the mandatory group. For the mandatory group, at the county level only one Two Plan model county had a positive and statistically significant association between MCP participation and total monthly expenditures. This county was San Bernardino, with a coefficient of 0.038 (Model 2). No change in monthly claimant volume had been found for the mandatory aid categories group in San Bernardino. The two counties that had consistently indicated claimant volume increases overall and by diagnosis category (Fresno and Kern) were examined. Fresno showed no change in expenditures with increasing MCP participation and also indicated significant annual declines for 1995 through 1997 (data not shown). For Kern, MCP participation also was not associated with expenditures (coefficient of 0.006, p=0.16). One county (Santa Clara) indicated a significant but negative association between the level of MCP participation and total expenditures.

The coefficient on Medi-Cal enrollment generally was not significant for the mandatory group with the exception of Fresno (where the coefficient was negative and statistically different from 1) and San Bernardino (where the coefficient was positive and exceeded 1). Of the eight Two Plan model counties that had PHP participation prior to the carve-out, the coefficient for PHP participation was statistically significant in the mandatory group for only one county (San Joaquin). In the other seven counties, the null hypothesis that PHP participation did not affect monthly CCS expenditures could not be rejected.

For the non-mandatory group, the coefficient for MCP participation was positive and approached statistical significance for two counties, Contra Costa and San Joaquin. In these counties, CCS claimant volume had not changed with increasing MCP participation. Contra Costa showed large annual declines in expenditures that were significant for 1995 and 1996. However, the MCP coefficient and year dummies were sensitive to the inclusion of PHP participation and did not differ from zero when PHP participation was dropped. The coefficient for MCP participation was negative though not significant for Alameda, Los Angeles, and Riverside. Earlier findings had indicated no significant impact of the rate of managed care participation for claimant volume in Alameda, Los Angeles, or Riverside (**Table 5.10**).

For both the mandatory and non-mandatory groups, the county-specific models produced coefficients for PHP and for Medi-Cal variables that generally had high standard errors. For the non-mandatory group, higher Medi-Cal enrollment was associated with higher total CCS expenditures in Kern and in Los Angeles, but exceeded one in only one county (Los Angeles). In the non-mandatory group, PHP participation was associated with lower CCS expenditures in Alameda, Los Angeles, and Riverside.

Pre-Post Comparison Combining Two Plan and Non-Expansion Counties

Results using comparison counties are presented in **Table 6.8**, **Regression results for CCS expenditures—Two Plan and non-expansion counties**. As with the claimant volume outcome,

Table 6.8 – Regression results for CCS expenditures – Two plan and non-expansion counties (coefficients and absolute t statistics)

Variable	Dependent variable=log(expenditures)							
	Two Plan and non-expansion independent CCS counties (n=20)				Two Plan, non-expansion independent CCS counties, matched urban-rural score (n=23)			
	Non-mandatory aidcodes		Mandatory aidcodes		Non-mandatory aidcodes		Mandatory aidcodes	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Percent MCP (pct2cpli)	0.030 (2.317)	---	0.001 (0.898)	---	0.022 (1.677)	---	0.000 (0.192)	---
Post carve-out (post)	-0.113 (1.577)	---	0.109 (1.594)	---	-0.138 (2.114)	---	0.048 (0.498)	---
Post carve-out, no default (post1_a)	---	-0.030 (0.500)	---	0.130 (2.050)	---	-0.068 (1.266)	---	0.061 (0.579)
Post default (post2_a)	---	0.025 (0.220)	---	0.190 (1.850)	---	-0.042 (0.381)	---	0.062 (0.336)
log Medi-Cal enrolled (ln_s_enr)	0.627 (0.718)	0.721 (0.792)	0.843 (1.265)	0.827 (1.235)	0.616 (0.742)	0.666 (0.763)	0.512 (0.457)	0.500 (0.447)
Percent PHP (pct2_php)	0.029 (1.436)	0.017 (0.845)	-0.000 (0.023)	0.000 (0.077)	0.022 (1.242)	0.014 (0.800)	-0.002 (0.502)	-0.002 (0.498)
1995	-0.008 (0.142)	-0.010 (0.174)	-0.063 (0.970)	-0.063 (0.974)	0.051 (0.824)	0.050 (0.807)	-0.118 (1.280)	-0.118 (1.280)
1996	0.103 (1.329)	0.096 (1.197)	-0.203 (2.148)	-0.205 (2.175)	0.148 (1.825)	0.145 (1.728)	-0.191 (2.022)	-0.191 (2.032)
1997	0.144 (1.444)	0.153 (1.494)	-0.163 (1.464)	-0.162 (1.452)	0.241 (2.200)	0.249 (2.228)	-0.092 (0.823)	-0.091 (0.812)
N	960	960	960	960	1,104	1,104	1,104	1,104
R squared	0.94	0.94	0.90	0.90	0.92	0.92	0.88	0.88

Each model includes county fixed effects and 3 season variables; the omitted county is Tulare County, the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.
(1) Post indicator for carve-out period and continuous MCP variable
(2) Post indicators for carve-out period prior to default, and post default.
[a] Can reject hypothesis that ln_s_enr = 1, $p < 0.05$

findings are presented using two different comparison groups of the eight (8) independent CCS program counties, and the eleven (11) counties that have independent CCS programs and/or match expansion county urban-rural continuum scores.

For the mandatory group, the addition of a comparison group did not alter the earlier conclusion that the percent of beneficiaries in managed care was not associated with monthly expenditures. Unlike the earlier result (**Table 6.3**), however, the post carve-out indicators did suggest a post carve-out increase (Model 1) when Two Plan and the eight independent CCS program counties were combined. These increases of 14 percent (in the initial carve-out months) and 21 percent (in the post default months) disappeared when the Two Plan counties were combined with the preferred comparison group of eleven non-expansion counties. The preliminary conclusion that expenditures did not increase significantly due to the carve-out was thus sustained.

For the non-mandatory group, the specification continued to indicate a significant expenditure increase associated with increased MCP participation rates when the eight independent CCS program counties were included (Model 1). As earlier, the two post indicators did not indicate any effect. When combined with the preferred comparison group of eleven non-expansion counties, however, the coefficient fell in magnitude (from 0.030 using eight comparison counties to 0.022) but also was no longer significant at $p=0.11$ (Model 1). Coupled with the null findings using the two post indicators, the results do not appear to support a significant increase in monthly CCS expenditures in the non-mandatory group that was caused by the carve-out. Notably for the non-mandatory group, the addition of the eleven comparison counties (and to a lesser extent with the addition of the eight comparison counties), the year dummies for 1996 and 1997 tended to indicate an independent time trend of increasing monthly CCS expenditures.

For the outcome of expenditures per total claimants, results for the mandatory group using a continuous MCP measure and combining the Two Plan and the non-expansion counties were consistent with earlier findings and did not differ with the comparison group used. These results are summarized in **Table 6.9, Regression results for CCS expenditures per total claimants—Two Plan and non-expansion counties**. Comparison with the eight independent non-expansion counties suggested an increase in expenditures per claimants in the initial carve-out months but no change in the post default months. A similar increase (although smaller and magnitude and only approaching statistical significance at the 5 percent level) was found when Two Plan and the eleven comparison counties were combined. A likely explanation is that those expansion counties that never implemented default/mandatory enrollment during the study period were those that experienced increased expenditures per claimants. Adding to this effect could be those counties that had extended pre default experience with the carve-out. The reason that this may have occurred could be related to characteristics of those counties that did not contribute post default observations to the study (Riverside, San Bernardino), but the mechanism is not known. In terms of general conclusions about carve-out impact, it appears reasonable to conclude that the carve-out did tend to reduce total expenditures per claimant, and also that there was a general time trend during the study period toward lower per claimant expenditures.

Table 6.9 – Regression results for CCS expenditures per claimants – Two plan and non-expansion counties (coefficients and absolute t statistics)

Variable	Dependent variable=log(expenditures per claimants)							
	Two Plan, non-expansion independent CCS counties, matched urban-rural score (n=23)				Two Plan and non-expansion independent CCS counties (n=20)			
	Non-mandatory aidcodes		Mandatory aidcodes		Non-mandatory aidcodes		Mandatory aidcodes	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Percent MCP (pct2cpli)	0.00 (0.28)	---	-0.00 (2.77)	---	0.01 (0.52)	---	-0.00 (5.18)	---
Post carve-out (post)	-0.06 (0.88)	---	0.20 (2.77)	---	-0.04 (0.65)	---	0.22 (3.23)	---
Post carve-out, no default (post1_a)	---	-0.03 (0.48)	---	0.13 (1.80)	---	-0.02 (0.23)	---	0.15 (2.42)
Post carve-out, default (post2_a)	---	-0.03 (0.45)	---	-0.26 (4.25)	---	-0.04 (0.39)	---	-0.11 (1.24)
log Medi-Cal enrolled (ln_s_enr)	-0.80[a] (1.36)	-0.84[a] (1.41)	-0.62 (0.73)	-0.57 (0.68)	-0.58[a] (0.93)	-0.60[a] (0.96)	-0.87[a] (1.52)	-0.82[a] (1.44)
Percent PHP (pct2_php)	-0.00 (0.31)	-0.01 (0.55)	0.00 (0.10)	-0.00 (0.28)	-0.01 (0.49)	-0.01 (0.85)	0.00 (0.31)	-0.00 (0.08)
1995	-0.06 (1.14)	-0.06 (1.11)	-0.20 (2.58)	-0.19 (2.57)	-0.12 (3.18)	-0.12 (3.27)	-0.18 (3.06)	-0.18 (3.03)
1996	-0.00 (0.05)	-0.00 (0.00)	-0.32 (3.44)	-0.32 (3.38)	-0.05 (0.67)	-0.05 (0.65)	-0.33 (3.68)	-0.32 (3.59)
1997	-0.06 (0.66)	-0.05 (0.55)	-0.41 (3.35)	-0.41 (3.38)	-0.13 (1.51)	-0.12 (1.37)	-0.45 (3.86)	-0.45 (3.91)
N	1,104	1,104	1,104	1,104	960	960	960	960
R squared	0.35	0.35	0.36	0.36	0.44	0.44	0.41	0.40

Each model includes county fixed effects and 3 season variables; the omitted county is Tulare County, the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.

(1) Post indicator for carve-out period and continuous MCP variable
(2) Post indicators for carve-out period prior to default, and post default.
[a] Can reject hypothesis that ln_s_enr = 1, $p < 0.05$

Summary of Findings for Expenditures in Individual Two Plan Counties

None of the Two Plan counties showed a significant, positive effect of the MCP participation rate on monthly CCS expenditures in the mandatory group. Results were more mixed in the non-mandatory group where one county showed an increase and three counties showed declines. To the extent that Medi-Cal field office changes or CCS authorization protocols (and general behavior change on the part of providers) contribute to the observed carve-out effects for the mandatory group, some impact might be expected on the non-mandatory group as well in those counties. If there is little pre carve-out circumvention of CCS for the non-mandatory group, this would explain an effect for the mandatory group that is not detected for the non-mandatory group.

It should be noted that in the single Two Plan county that did not implement mandatory managed care by the end of the study period—Tulare— no changes in mean monthly total expenditures or in mean monthly expenditures per total CCS claimants were found by year.

Expenditures for Combined COHS and Non-Expansion Counties

The impact of the carve-out on expenditures and on expenditures per total claimants is illustrated for the COHS expansion counties in **Table 6.10, Regression results for total CCS expenditures—Expansion COHS and non-expansion counties, mandatory group** and in **Table 6.11**. As noted earlier, the summary of findings in COHS counties focuses on the impact for the mandatory managed care group. The mandatory group in the COHS counties includes many of the aid eligibility categories that confer voluntary participation in the Two Plan counties.

Results for the COHS counties without comparison to non-expansion counties indicated no change using the single post indicator (Model 1 in **Table 6.10**) but did show a significant increase in expenditures caused by increasing rates of MCP participation (Model 2). It should be noted that these models are based on few observations due to the small number of expansion COHS counties. Using the single post indicator, the carve-out was associated with increased expenditures in both specifications using a non-expansion county comparison group. These specifications suggested a 28 percent increase in COHS counties when compared with the eight independent CCS program counties, and a slightly small 23 percent increase when compared with the preferred comparison group of eleven counties. As with the findings from combining Two Plan and non-expansion counties, however, the continuous MCP specification produced a different result when the two different comparison groups were used. The carve-out was associated with increased CCS expenditures when the eight independent CCS program counties were combined with the COHS counties, but not when the eleven non-expansion counties were combined.

As discussed in the Chapter 5 evaluation of COHS trends in claimant volume, both COHS expansion counties implemented the CCS carve-out around January 1996. Consequently it is difficult to identify the carve-out effect in these counties when year dummies are in the model. This is particularly relevant to the specifications that use a post carve-out intercept shift (such as that used in Model (1)). Removing the year dummies is not an alternative because this specification would

Table 6.10 – Regression results for total CCS expenditures – Expansion COHS and non-expansion counties, mandatory group (coefficients and absolute t statistics)

| Variable | Dependent variable=log(expenditures) | | | | | |
| | COHS expansion counties (n=2) | | COHS and non-expansion independent CCS counties (n=10) | | COHS, non-expansion independent CCS counties, matched urban-rural score (n=13) | |
	(1)	(2)	(1)	(2)	(1)	(2)
Percent MCP (pct2cohs)	---	0.017 (46.413)	---	0.003 (5.236)	---	0.002 (1.509)
Post carve-out (post)	-0.021 (0.506)	-0.016 (0.343)	0.248 (2.633)	-0.014 (0.371)	0.204 (1.822)	0.028 (0.552)
log Medi-Cal enrolled (ln_s_enr)	1.614 (1.084)	1.644 (1.130)	0.488 (0.475)	0.589 (0.578)	0.763 (0.769)	0.825 (0.812)
Percent PHP (pct2_php)	0.002 (1.385)	0.000 (0.433)	-0.005 (1.197)	0.001 (0.324)	-0.006 (2.389)	-0.004 (1.343)
1995	-0.064 (1.413)	-0.064 (1.480)	-0.007 (0.111)	-0.003 (0.048)	0.007 (0.095)	-0.005 (0.070)
1996	0.240 (6.521)	-1.455 (411.166)	-0.092 (1.322)	-0.098 (1.397)	-0.071 (0.887)	-0.077 (0.932)
1997	0.401 (2.291)	-1.309 (8.825)	-0.011 (0.087)	-0.013 (0.096)	0.085 (0.735)	0.083 (0.715)
N	96	96	480	480	624	624
R squared	0.97	0.97	0.87	0.87	0.84	0.84

Each model includes county fixed effects and 3 season variables; the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.
(1) Post indicator for carve-out period
(2) Post indicator for carve-out period and continuous MCP variable
Cannot reject hypothesis that ln_s_enr = 1, $p < 0.05$ for any of the models.

produce biased estimates of carve-out effect. Although not ideal, the preferred model is the specification that combines the COHS counties with the eleven non-expansion counties. This specification suggests a trend toward increased expenditures that is associated with increased MCP participation, although the coefficient does not reach statistical significance (coefficient of 0.002).

Table 6.11 – Regression results for CCS expenditures per total claimants – Expansion COHS and non-expansion counties, mandatory group (coefficients and absolute t statistics)

Variable	Dependent variable=log(expenditures per claimants)					
	COHS expansion counties (n=2)		COHS and non-expansion independent CCS counties (n=10)		COHS, non-expansion independent CCS counties, matched urban-rural score (n=13)	
	(1)	(2)	(1)	(2)	(1)	(2)
Percent MCP (pct2cohs)	---	0.009 (78.364)	---	-0.001 (1.585)	---	-0.001 (1.386)
Post carve-out (post)	0.059 (1.283)	-0.062 (1.435)	-0.043 (0.755)	0.029 (0.532)	-0.035 (0.562)	0.043 (0.765)
log Medi-Cal enrolled (ln_s_enr)	-0.909 (0.885)	-0.893 (0.885)	-0.927 (0.287)	-0.955 (1.157)	0.259 (0.280)	0.232 (0.248)
Percent PHP (pct2_php)	0.001 (0.784)	0.001 (0.375)	0.002 (0.662)	-0.000 (0.001)	-0.004 (1.313)	-0.005 (1.827)
1995	-0.166 (1.469)	-0.166 (1.477)	-0.139 (2.078)	-0.140 (2.090)	-0.143 (4.092)	-0.144 (1.888)
1996	-0.404 (3.823)	-1.335 (13.816)	-0.310 (1.148)	-0.308 (4.130)	-0.328 (4.092)	-0.326 (4.075)
1997	-0.547 (32.127)	-1.486 (43.527)	-0.403 (2.882)	-0.402 (2.876)	-0.336 (2.716)	-0.335 (2.706)
N	96	96	480	480	624	624
R squared	0.58	0.58	0.38	0.38	0.34	0.34

Each model includes county fixed effects and 3 season variables; the omitted season is months 1-3, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.
(1) Post indicator for carve-out period
(2) Post indicator for carve-out period and continuous MCP variable
Cannot reject hypothesis that ln_s_enr = 1, $p < 0.05$ for any of the models.

Expenditures per total claimants appeared to increase in the model limited to COHS counties (**Table 6.11**). In contrast, the specifications with non-expansion counties showed a trend toward lower expenditures per claimants, but none of the coefficients was significant. Thus it appeared that the large claimant volume increases and the less substantial expenditures increase resulted in no significant differences in expenditures per claimants.,

In summary, the COHS expansion counties suggested that expenditures increased with the carve-out for the mandatory managed care group. Limitations to the model caused by the timing of carve-out implementation in COHS counties make it difficult to conclude definitively that the carve-out caused

the observed increases. While the Two Plan counties did not show a significant expenditure increase for the mandatory group, they did show increases for the non-mandatory group in some specifications. Because the mandatory group in the COHS counties includes a number of aid categories that are in the non-mandatory group in the Two Plan counties, the composition of the groups may explain the different COHS and Two Plan findings. Overall, based on the findings from the models combined with the non-expansion counties, it appears that expenditures did not increase in the Two Plan counties for their mandatory group; that expenditures did increase in the non-mandatory group in these counties; and that expenditures increased in the COHS counties for their mandatory group.

6.3 Carve-out Impact on CCS Expenditures Within Selected Medi-Cal Eligibility Aid Categories

The following analyses focus on two eligibility aid categories that confer a managed care requirement in all expansion counties (aid category 30—cash assistance, and aid category 34—no cash assistance), and one eligibility aid category that confers a managed care requirement only in COHS counties (aid category 60—SSI recipients). Findings are presented for specifications using post carve-out indicators and then for specifications using continuous MCP variables. These sections also include results from models combining Two Plan and/or COHS counties with non-expansion counties.

Findings for CCS Expenditures: Pre and Post Carve-Out

The pre-post multivariate comparisons for aid categories 30 and 34—for which Two Plan and COHS counties can be combined—are provided in **Table 6.12, Pre and post carve-out CCS expenditures for two mandatory managed care Medi-Cal aid categories**. Results are provided (1) for the Two Plan model counties only; (2) for the COHS counties only; (3) for the Two Plan and COHS counties combined; and (4) for the Two Plan and non-expansion counties combined; and (5) for Two Plan model, COHS, and non-expansion counties.

The models for aid category 30 and aid category 34 show no difference in total CCS expenditures associated with the post carve-out period for either of the aid categories. This finding holds for the Two Plan counties (Model 1), the COHS counties (Model 2), and the Two Plan counties combined with the COHS counties (Model 3). A model that combined the Two Plan, COHS, and eleven non-expansion counties (Model 4) also did not show a significant increase associated with the expansion counties' post carve-out period, although the coefficient increased while the standard error fell for aid category 30. Aid category 34 did not show any increase when expansion and non-expansion counties were combined. Combining Two Plan and non-expansion counties (Model 5) also showed no effect for the initial carve-out months or for the post default months. The coefficient suggested a decline in CCS expenditures associated with the post default carve-out period in expansion counties for aid category 34, although the effect was not statistically significant.

Table 6.12 – Pre and post carve-out CCS expenditures for two mandatory managed care Medi-Cal aid categories (coefficients and absolute t statistics)

	Aid categories									
Variable	30 (cash assistance)					34 (no cash assistance)				
Model	2 plan	COHS	2 plan, COHS	2 plan, COHS, & 11	2 plan & 11	2 plan	COHS	2 plan, COHS	2 plan, COHS, & 11	2 plan & 11
	(4)	(5)	(3)	(1)	(2)	(4)	(5)	(3)	(1)	(2)
Indicator for post carve-out (post1)	-0.02 (0.32)	-0.12 (0.50)	-0.03 (0.42)	0.14 (1.12)	---	0.04 (0.26)	0.17 (0.94)	-0.08 (0.47)	-0.35 (1.38)	---
Indicator for post, no default (post1_a)	---	---	---	---	0.10 (0.99)	---	---	---	---	-0.28 (1.17)
Indicator for post default (post2_a)	---	---	---	---	0.14 (0.76)	---	---	---	---	-0.58 (1.60)
log Medi-Cal enrolled	1.56 (2.78)	-2.42 (0.93)	1.55 (2.95)	2.06 (3.56)	2.09 (3.20)	0.94 (1.50)	0.59 (1.06)	1.18 (2.88)	1.82 (2.76)	1.90 (2.63)
Percent PHP ("CCS-include")	-0.00 (0.18)	-0.02 (1.67)	-0.00 (0.06)	-0.00 (0.29)	-0.00 (0.86)	-0.03 (1.29)	0.01 (0.81)	-0.02 (1.30)	-0.05 (1.92)	-0.06 (1.83)
1995	-0.08 (1.31)	-0.36 (1.56)	-0.16 (2.05)	-0.09 (1.03)	-0.05 (0.53)	-0.02 (0.19)	0.01 (0.03)	-0.00 (0.05)	-0.25 (1.15)	-0.29 (1.22)
1996	0.02 (0.29)	-0.64 (3.68)	-0.04 (0.55)	-0.23 (1.91)	-0.20 (1.53)	0.00 (0.03)	0.08 (0.32)	0.01 (0.05)	-0.17 (0.79)	-0.23 (1.00)
1997	0.06 (0.56)	-1.05 (2.75)	0.03 (0.24)	-0.05 (0.46)	-0.02 (0.18)	0.04 (0.23)	-0.11 (0.58)	0.00 (0.02)	0.44 (1.69)	0.49 (1.68)
N	576	144	672	1,200	1,104	576	144	672	1,200	1,104
R squared	0.88	0.78	0.89	0.82	0.82	0.70	0.54	0.70	0.60	0.60

(1) Model includes the 12 Two-Plan counties, Orange and Santa Cruz COHS counties, and the non-expansion counties, N=1,200 (25 counties) with fixed county effects.
(2) Model includes the 12 Two-Plan counties and 11 non-expansion counties, N=1,104 with fixed county effects.
(3) Model includes the 12 Two-Plan counties and Orange and Santa Cruz COHS counties, N=672 (14 counties) with fixed county effects.
(4) Model includes the 12 Two-Plan counties, N=576 (12 counties) with fixed county effects.
(5) Model includes the expansion COHS counties (Orange and Santa Cruz) and referent Tulare, N=144 (3 counties) with fixed county effects.
Each model includes fixed county effects and 3 season dummies, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed. Aid categories 30 and 34 confer mandatory managed care status in all expansion counties. The hypothesis that ln_s_enr = 1, $p<0.05$ was not rejected for any model.

The findings for the pre-post comparison for aid category 60 (SSI recipients) are provided in **Table 6.13, Pre-post differences in CCS expenditures for aid category 60 (SSI)**. This is the largest Medi-Cal eligibility aid category that confers mandatory managed care participation status in COHS counties but confers voluntary participation status in Two Plan model counties. The results for the Post indicator for Two Plan counties (Model 1) and for Two Plan counties combined with the eleven non-expansion counties (Model 2) show no statistically significant increase in CCS expenditures, as might be expected. For the specification of Two Plan and non-expansion counties, the coefficient reverses sign although the apparent decline in expenditures does not reach statistical significance. The model limited to Two Plan counties suggests a statewide time trend of increasing monthly expenditures. Year dummies were all significant and indicated relatively large effects.

In contrast, results in Models 4 and 5 show a substantial increase in CCS expenditures in the COHS counties. The results indicate a 32 percent increase in expenditures associated with the carve-out. Increased monthly expenditures for 1996 and 1997 were indicated by the year dummies only in the model limited to COHS counties. Combining COHS and non-expansion counties, the post carve-out effect was sustained (Model 5). Finally, specifying both an initial carve-out period and a post carve-out period suggested a decline in expenditures during the initial period (which is based on several months of transition in Orange County only) and an increase in expenditures during the post default period (Model 6). This second indicator reflects approximately two years of full implementation in the COHS counties. These results indicate that total CCS expenditures for claimants with SSI eligibility did not change in Two Plan model counties but that they increased in COHS counties.

Model Specification with Continuous Carve-out Effect Measure

The results of the multivariate analysis for total CCS expenditures by aid category are summarized in **Table 6.14, Regression results for CCS expenditures for three Medi-Cal aid categories**.

Earlier findings revealed increased monthly claimant volume as participation in the managed care plans increased for aid categories 30, 34, and 60 when managed care requirements applied to the specific aid category being studied. In contrast, total monthly CCS expenditures generally did not increase with expanded managed care participation.

The coefficient representing the percent of managed care participation carve-out effect was negative and not significant for aid category 30 and for aid category 34 in these models combining expansion and non-expansion counties. This held for models with Two Plan counties as well as for models with expansion COHS counties. In contrast, in aid category 60, expenditures appeared to increase with MCP participation (p=0.07) for Two Plan counties in a combined model with the eleven non-expansion counties. This finding did not hold for the COHS counties. In the Two Plan counties, unlike the COHS counties, enrollment in Medi-Cal managed care continued to be voluntary for beneficiaries in aid category 60 in the Two Plan. There is no clear reason that increasing managed care participation in the Two Plan counties would cause increased expenditures, particularly at the low levels of managed care participation (approximately 6.1 percent in the post carve-out period,

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Table 6.13 – Pre and post carve-out CCS expenditures for aid category 60 (SSI)

Variable	OLS for log (expenditures)					
Model	Two plan	Two plan & 11 non-expansion		COHS	COHS & 11 non-expansion	
	(1)	(2)	(3)	(4)	(5)	(6)
Indicator for post carve-out	0.04 (0.63)	0.05 (0.41)	---	0.28 (5.30)	0.33 (2.30)	---
Indicator for post, no default	---	---	0.02 (0.29)	---	---	-0.17 (2.92)
Indicator for post carve-out, default	---	---	0.09 (0.49)	---	---	0.28 (1.95)
log Medi-Cal enrolled	-0.99[a] (1.42)	-0.08 (0.06)	0.10 (0.07)	-1.21 (0.64)	0.72 (0.29)	0.71 (0.28)
Percent PHP ("CCS-include")	0.03 (2.22)	0.02 (1.30)	0.02 (1.54)	-0.02 (0.57)	-0.01 (0.25)	-0.01 (0.25)
1995	0.09 (2.84)	0.12 (1.79)	0.11 (1.46)	0.06 (0.55)	0.13 (1.06)	0.14 (1.09)
1996	0.23 (4.54)	0.18 (1.47)	0.16 (1.13)	0.23 (6.75)	0.12 (0.49)	0.13 (0.51)
1997	0.33 (6.61)	0.29 (1.63)	0.27 (1.33)	0.29 (29.01)	0.26 (0.89)	0.26 (0.91)
N	576	1,104	1,104	144	624	624
R-squared	0.94	0.90	0.90	0.90	0.77	0.77

(1) Model includes the 12 Two-Plan counties, N=576 (12 counties) with fixed county effects and referent Tulare.
(2) and (3) Model includes Two-Plan counties and 11 non-expansion counties, N=1,104 (23 counties) with fixed county effects and referent Tulare.
(4) Model includes expansion COHS counties (Orange and Santa Cruz), N=144 (3 counties) with fixed county effects and referent Tulare.
(5) and (6) Model includes expansion COHS counties (Orange and Santa Cruz) and 11 non-expansion counties, N=624 (13 counties) with fixed county effects and referent Ventura.
Each model includes 3 season dummies, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed. Aid category 60 confers mandatory managed care status in expansion COHS counties (Orange and Santa Cruz) and non-mandatory managed care status in Two-Plan model counties.
[a] Can reject hypothesis that ln_s_enr = 1, $p < 0.05$

Table 6.14 – Regression results for CCS expenditures for three (3) Medi-Cal aidcodes (coefficients and absolute t statistics)

Variable	OLS for log(expenditures)					
Aid category	30 (cash aid)		34 (no cash aid)		60 (SSI)	
Counties	Two Plan & non-expansion (1)	Two Plan, COHS, non-expansion (2)	Two Plan & non-expansion (1)	Two Plan, COHS, non-expansion (2)	Two Plan & non-expansion (1)	COHS & non-expansion (3)
Percent MCP (pct_mcp)	0.000 (0.250)	-0.000 (0.096)	-0.006 (1.386)	-0.001 (0.283)	0.026 (1.902)	-0.002 (1.164)
Post carve-out indicator	0.119 (1.290)	0.146 (1.509)	-0.220 (0.881)	-0.309 (1.271)	-0.086 (1.037)	0.500 (2.753)
log Medi-Cal enrolled	2.085 (3.222)	2.058 (3.416)	1.935 (2.686)	1.806 (2.718)	-0.578 (0.122)	0.702 (0.285)
Percent PHP (pct2_php)	-0.001 (0.177)	-0.002 (0.292)	-0.057 (1.805)	-0.055 (1.816)	0.027 (1.921)	-0.008 (0.737)
1995	-0.049 (0.534)	-0.093 (1.033)	-0.290 (1.225)	-0.251 (1.150)	0.107 (1.519)	0.132 (1.065)
1996	-0.199 (1.555)	-0.228 (1.905)	-0.235 (1.028)	-0.165 (0.771)	0.160 (1.244)	0.129 (1.515)
1997	-0.026 (0.243)	-0.048 (0.451)	0.488 (1.721)	0.447 (1.661)	0.251 (1.330)	0.259 (0.895)

(1) Models include the 12 Two-Plan counties and 11 non-expansion counties, N=1,104 (23 counties).
(2) Models include the 12 Two-Plan counties, Orange and Santa Cruz counties, and 11 non-expansion counties, N=1,000 (25 counties).
(3) Model includes the expansion COHS counties (Orange and Santa Cruz) and 11 non-expansion counties, N=624 (13 counties).
Aidcodes 30 and 34 confer mandatory managed care status in all expansion counties; aidcode 60 confers mandatory managed care status in COHS counties (Orange and Santa Cruz) and non-mandatory managed care status in Two-Plan model counties. Each model includes county effects and 3 seasonal variables; the omitted county is Ventura County, and the omitted year is 1994. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.
[a] Can reject hypothesis that ln_s_enr = 1, $p<0.05$

illustrated in **Table 5.13**) in the Two Plan counties, The signs of the year dummies were not consistent and were generally not significant for the three aid categories.

PHP participation was associated with monthly expenditures (negatively) for aid category 34 but not for other aid categories. As discussed earlier, if the CCS-include PHPs did have children with CCS eligible medical diagnoses enrolled, then total CCS expenditures in the fee-for-service system

might decline proportionately. It can further be hypothesized that if such children were enrolled in PHPs, they would most likely tend to be children with lower overall severity or intensity of service need. If both of these hypotheses are true, then CCS expenditures per claimant in the fee-for-service system would be expected to be higher as PHP participation increased due to the higher average case-mix of the CCS claimants remaining in the fee-for-service system. (An alternative hypotheses might be that children identified with CCS eligible conditions would disenroll and that there might be an incentive for PHPs/PHP contracting physicians to identify eligible children and refer them to CCS, potentially resulting in disenrollment). The findings did not provide support for these hypotheses.

Summary

Findings from pooling the aid categories showed no expenditure increases for the Two Plan counties, but a trend toward increased expenditures in the COHS counties. Disaggregating by aid category does reduce the size of the beneficiary pool and may make effect estimation more difficult. Results by aid category indicated no increases in the Two Plan counties for the three categories studied, with the exception of a marginally significant increase in SSI claimants per percent increase in managed care participation for the Two Plan counties. In contrast, expenditures did increase in the COHS models even when a comparison group was employed, for the SSI aid category only. The fact that only the SSI aid category showed any positive time trend in expenditures (based on the year effects) could mean that expenditure declines over the study period outweighed any small increases that occurred as claimant volume increased. It is possible that the types of services involved in the apparent increased expenditures are those more frequently accessed by children in the SSI category. This could help to explain why claimant volume increased more substantially in aid categories 30 and 34 but expenditures did not change, while smaller (or nonsignificant) claimant volume increases in aid category 60 appeared to translate into increased expenditures.

6.4   Change in the Distribution of Total CCS Claim Expenditures

The median and other percentiles capture features of the distribution that the mean and total expenditure measures do not. Earlier findings showed no significant carve-out effect on expenditures and indicated a general time trend of declining monthly expenditures. Post carve-out changes in the lower and the upper tails of the distribution clarify the carve-out impact. The following paragraphs describe the rationale and findings from the evaluation of changes in this distribution.

Hypotheses and Rationale

The carve-out effect may be concentrated among those children with lower monthly costs. The general expectation is that the volume of children with relatively low expenditures for CCS-authorized services will increase with the carve-out. Little change is expected for those children with higher expenditures, although some marginal increases in authorizations might occur. Some new high cost referrals (e.g., of hospitalizations for children with lower likelihood of being referred

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in the pre carve-out period) also would be consistent with the general carve-out effect. The net result is a hypothesized change in the distribution of per claimant total expenditures.

An overall decline in per claimant expenditures that is unrelated to the carve-out effect could contribute to both mandatory and non-mandatory group patterns. Both carve-out effects and secular changes could take place. If no change occurred in caseload composition as measured by per claimant expenditures, then the distribution would not change. If medical costs increased overall, then an upward shift in the median and full distribution would be expected. If costs were declining at the higher end of the distribution due to shorter inpatient stays over time, then the upper but not the lower tails of the distribution would likely be affected. Changes in services that can be authorized by CCS also could take place. If expenditures on certain services increase due to CCS coverage changes, then per claimant expenditure could change across the distribution or at lower or upper tails. The effect would depend on the cost intensity of the service(s) and on the relevance of the service(s) to children whose expenditures (all else equal) would be at the lower and upper tails.

The distribution of monthly CCS expenditures per individual claimant was evaluated across expansion and non-expansion counties. The distribution measure used individuals within a month and county as the unit of analysis.[73] This measure is used to show how the monthly per claimant expenditure total in the pre carve-out period compares to the total in the post period. (This treats the monthly totals as independent even though they are not completely independent with some claimants contributing to multiple monthly values.) The percentile values for the relevant strata (i.e., mandatory group status for a given month of service in a given county) were generated from these claimant-month expenditures.[74]

Distributions for pre and for post carve-out periods were evaluated by pooling all claimants from Two Plan counties. Trends also were evaluated by county for insight into earlier findings on claimant volume and total expenditures. Per claimant expenditures in the monthly time series also are presented for several counties to illustrate possible impact. Finally, a multivariate analysis replicates these comparisons but controls for time trend and Medi-Cal program variables.

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[73] Each claimant's expenditures were summarized within the service date month. For monthly time series and for pre-post comparisons, each monthly expenditure total for the claimant contributed one observation. It was not possible to annualize claimant expenditures because Medi-Cal enrollment and CCS medical eligibility are not known for months in which no CCS claims were authorized for a child. Thus a monthly measure at the county level must be used. Otherwise total claimant expenditures would be a function of the number of months with observed claims in addition to a function of the effect of interest (e.g., authorization practices, diagnosis and severity for the CCS claimant).

[74] Claimants with total monthly expenditures less than $1 had their expenditures set to $1 and were not included in the monthly counts. This included monthly claimants with net negative monthly expenditures. More discussion of such claimants is provided in Chapter 3. Overall, 15,630 or 3.0 percent of all claimant-months were not included. These claimant-months comprised 6.2 percent of pre carve-out, mandatory group claimant-months; 1.2 percent of post carve-out, mandatory group claimant-months; 2.5 percent of pre carve-out, non-mandatory group claimant-months; and 0.6 percent of post carve-out, non-mandatory group claimant-months.

The distribution of monthly CCS expenditures per individual claimant also was evaluated for the 36 non-expansion counties. Descriptive trends over the study period were examined in addition to multivariate analysis of the distribution for claimants in mandatory and non-mandatory groups, as defined by Two Plan model participation criteria.

Pre and Post Carve-Out Distribution of Expenditures in Two Plan Counties

Figure 6.1, Distribution of per claimant expenditures in month—Percentiles in pre and post carve-out periods in the 12 Two Plan counties, mandatory managed care group, illustrates the pre-post differences in the distribution. This figure provides results for the mandatory group. The figure suggests little change in costs at the lower tail of the distribution. Lower costs around the middle of the distribution were evident for the post-carve-out period. This would be consistent with the following: increased volume of lower cost claimants in the lower tail of the distribution; increased volume of lower cost claimants throughout the lower and middle portions of the distribution; lower monthly expenditures for children in the caseload including those "newly" identified; or a combination of these patterns. The mandatory group patterns can be compared with the patterns for the non-mandatory group. **Figure 6.2, Distribution of per claimant expenditures in month—Percentiles in pre and post carve-out periods in the 12 Two Plan counties, non-mandatory managed care group**, illustrates the percentiles for the pre and post periods in the non-mandatory group. The figure does not suggest the same pattern of change across the middle of the distribution that was evident for the mandatory group. It does suggest that in the upper portion of the distribution, per claimant expenditure may have declined between the pre and post carve-out periods. One hypothesis was that expenditures per claimant could increase moderately across much of the distribution as more services are attributed to the CCS eligible diagnosis. The distributions for the mandatory and the non-mandatory group do not appear to support that hypothesis. However, these figures do not account for other time trends or county differences.

The actual percentiles for these counties were evaluated. The pre and post carve-out percentiles of log monthly claimant expenditures are provided in **Table 6.19A, Impact of carve-out claimant costs: Pre and post carve-out means for percentiles of per claimant expenditures—Two Plan model counties, Mandatory managed care group**, and in **Table 6.19B**. As in **Figure 17** and **Figure 18**, the percentiles come from ranking of all claimant-months in the 12 Two Plan counties by total expenditures. These rankings are performed for the pre carve-out period and for the post carve-out period, by managed care group status.

In the baseline, these tables illustrate different per claimant costs by mandatory group status. Per claimant expenditures were higher in the mandatory group relative to the non-mandatory group. For example, in the pre carve-out period, median monthly expended per claimant was lower for the non-mandatory group (approximately $206, **Table 6.19B**) than for the mandatory group (approximately $254, **Table 6.19A**). This is expected because aid categories in the mandatory group include a large number of children receiving high cost initial treatment for an identified diagnosis. In particular, the mandatory group includes most of the Medi-Cal eligible, low-income pregnant women and thus

Figure 6.1 – Distribution of per claimant expenditures in month—Percentiles in pre and post carve-out periods in the 12 Two Plan counties, mandatory managed care group
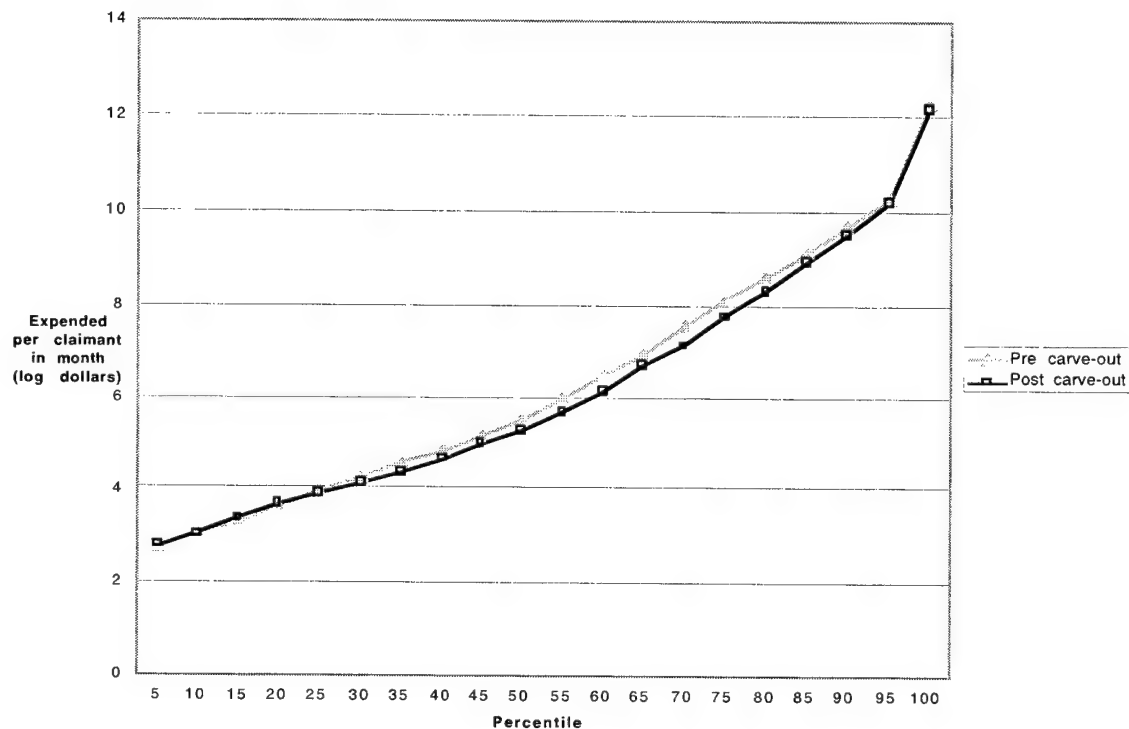
Figure 6.2 – Distribution of per claimant expenditures in month—Percentiles in pre and post carve-out periods in the 12 Two Plan counties, non-mandatory managed care group
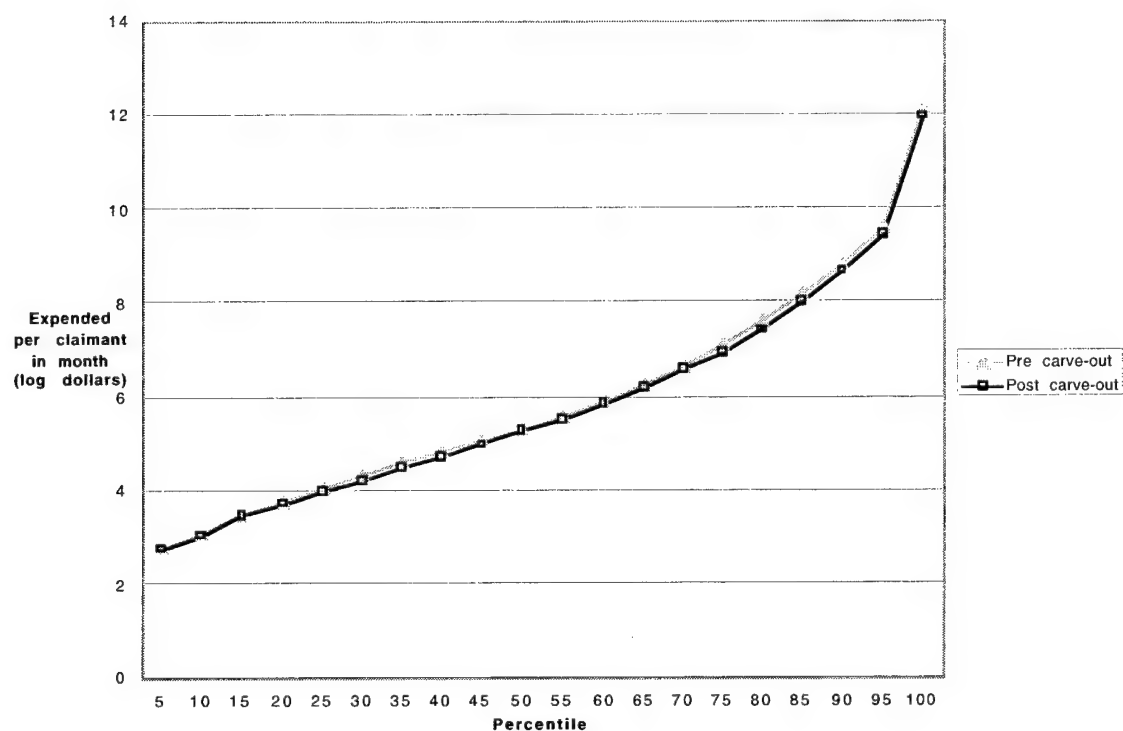
has a larger volume of the newborns who meet CCS medical eligibility and who have costly inpatient stays.

The last rows in **Table 6.19A** and **Table 6.19B** pool all claimant-months in Two Plan counties for the pre and post carve-out periods. The differences in mean per claimant expenditure illustrate the pre-post trend pooling all claimants. Experiences in the larger counties are expected to dominate the effect in these summary figures. For example, Los Angeles County contributed 78,772 of the total 126,073 pre carve-out, mandatory group claimant-months and 16,742 of the 47,194 post carve-out, mandatory group claimant months in the Two Plan counties. Mean per claimant expenditures declined for both groups. The mean per claimant expenditure in pre carve-out months in all Two Plan counties declined 9.4 percent from approximately $4,624 compared to $4,188 in the post carve-out months. For the non-mandatory group, the mean per claimant monthly expenditure declined 9.1 percent from approximately $2,514 in the pre carve-out period to $2,286 for the months following carve-out implementation. While the 10th percentile of per claimant expenditures showed little change for either group, costs were lower at the 25th, median, 75th, and 95th percentiles for both groups.

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Table 6.15A – Impact of carve-out on claimant costs: Pre and post carve-out percentiles of per claimant expenditure (log dollars) – Two-Plan model counties, Mandatory managed care group

County	Months in Period[b] N		Mean ($) monthly claimant expenditure (s.e.)		10th percentile log monthly claimant expenditure		25th percentile log monthly claimant expenditure		Median log monthly claimant expenditure		75th percentile log monthly claimant expenditure		95th percentile log monthly claimant expenditure	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Alameda	24	24	$6,876 (112)	$4,692 ** (102)	3.09	3.06 →	4.17	3.72 →	6.31	5.10 →	8.91	7.95 →	10.56	10.40 →
Contra Costa	37	11	$6,815 (110)	$4,107 ** (98)	3.09	3.06	4.37	3.82 →	6.50	5.14 →	8.95	7.81 →	10.53	10.24 →
Fresno	34	14	$5,724 (101)	$3,686 ** (95)	3.32	3.04 →	4.36	3.80 →	6.36	5.07 →	8.70	7.60 →	10.39	10.05 →
Kern	30	18	$6,646 (107)	$4,432 ** (99)	3.37	3.30	4.39	3.93 →	6.72	5.49 →	8.94	8.03 →	10.36	10.17 →
Los Angeles	39	9	$4,110 (100)	$3,854 ** (97)	3.06	3.05	3.89	3.94	5.35	5.29	7.79	7.67 →	10.16	10.14
Riverside	32	16	$5,201 (97)	$4,616 ** (99)	3.37	3.15 →	4.25	4.02 →	6.29	5.61 →	8.59	8.31 →	10.24	10.22
San Bernardino	32	16	$5,453 (102)	$5,165 (108)	3.31	3.06 →	4.25	3.98 →	6.01	5.57 →	8.53	8.16 →	10.32	10.40 ←
San Francisco	30	18	$4,001 (90)	$3,408 ** (94)	3.46	3.54	4.34	4.12 →	5.94	5.26 →	8.10	7.16 →	10.12	10.12
San Joaquin	25	23	$5,438 (107)	$3,569 ** (99)	3.05	3.09	4.19	3.91 →	6.16	5.20 →	8.42	7.38 →	10.36	10.00 →
Santa Clara	33	15	$5,294 (106)	$4,377 ** (100)	2.81	3.24 ←	3.90	4.16 ←	5.38	5.44	8.20	7.66 →	10.47	10.34
Stanislaus	37	11	$4,587 (100)	$4,239 (98)	2.20	3.07 ←	2.81	4.11 ←	4.62	5.90 ←	8.07	8.06	10.25	10.15
Tulare	48	0	$4,332 (96)	---	2.94	---	3.83	---	5.41	---	8.04	---	10.18	---
All 12 counties[a]	401	175	$4,624 (101)	$4,188 ** (99)	3.06	3.06	3.97	3.92 →	5.54	5.32 →	8.13	7.79 →	10.25	10.22 →

[a] Percentiles for all 12 Two Plan counties combined come from n=126,073 claimant-months in Pre period and n=47,194 claimant-months in Post period. A total of 8,883 claimant-months with net expenditures less than or equal to zero are excluded. Total claimant-months by county for Pre and

Table 6.15B – Impact of carve-out on claimant costs: Pre and post carve-out percentiles of per claimant expenditures (log dollars) – Two-Plan model counties, Non-mandatory managed care group

County	Months in Period[b] N Pre	N Post	Mean log monthly claimant expenditure (s.e.) Pre	Post	10th percentile log monthly claimant expenditure Pre	Post	25th percentile log monthly claimant expenditure Pre	Post	Median log monthly claimant expenditure Pre	Post	75th percentile log monthly claimant expenditure Pre	Post	95th percentile log monthly claimant expenditure Pre	Post
Alameda	24	24	$2,823 (86)	$2,400 ** (82)	3.09	3.04	3.96	3.89	5.16	5.10	7.18	6.95 ↓	9.76	9.49 ↓
Contra Costa	37	11	$2,624 (83)	$2,251 ** (78)	3.29	3.09 ↓	4.36	3.98 ↓	5.68	5.35 ↓	7.14	6.98	9.58	9.42
Fresno	34	14	$2,040 (76)	$2,309 ** (77)	2.82	2.81	3.89	3.84	5.00	5.05	6.92	7.12 ↑	9.39	9.55
Kern	30	18	$3,289 (89)	$2,937 ** (85)	3.25	3.17	4.34	4.23	6.00	5.93	7.73	7.53	9.89	9.73
Los Angeles	39	9	$2,501 (.83)	$2,272 ** (80)	3.12	3.05 ↓	4.06	4.01 ↓	5.28	5.23 ↓	7.06	6.93 ↓	9.61	9.47 ↓
Riverside	32	16	$2,662 (81)	$2,656 (84)	3.29	3.24	4.18	4.18	5.62	5.81 ↑	7.46	7.35	9.65	9.55
San Bernardino	32	16	$2,690 (80)	$2,092 ** (76)	3.30	3.08 ↓	4.25	3.98 ↓	5.62	5.19 ↓	7.44	6.96 ↓	9.60	9.37 ↓
San Francisco	30	18	$2,469 (84)	$2,127 ** (80)	3.46	3.48	4.31	4.20	5.52	5.43	7.00	6.68 ↓	9.58	9.39 ↓
San Joaquin	25	23	$2,042 (77)	$1,859 (77)	3.08	3.02	3.97	3.89	5.19	5.02	6.94	6.72 ↓	9.31	9.22

County	Months in Period[b] N		Mean log monthly claimant expenditure (s.e.)		10th percentile log monthly claimant expenditure		25th percentile log monthly claimant expenditure		Median log monthly claimant expenditure		75th percentile log monthly claimant expenditure		95th percentile log monthly claimant expenditure	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Santa Clara	33	15	$2,902 (91)	$2,406** (82)	3.07	3.29 ↑	3.98	4.33 ↑	5.23	5.34 ↑	6.86	6.79	9.77	9.55
Stanislaus	37	11	$1,914 (76)	$1,846 (80)	2.79	2.79	3.89	3.89	5.16	5.14	6.67	6.78	9.27	9.14
Tulare	48	0	$2,116 (80)	---	3.09	---	4.07	---	5.46	---	6.86	---	9.39	---
All 12 counties[a]	401	175	$2,514 (83)	$2,286** (80)	3.10	3.07 ↓	4.08	4.00 ↓	5.33	5.27 ↓	7.09	6.97 ↓	9.61	9.47 ↓

[a] Percentiles for all counties combined come from n=233,981 claimant-months in Pre period and n=96,556 claimant-months in Post period. A total of 6,498 claimant-months with net expenditures less than or equal to zero are excluded. Total claimant-months by county for Pre and Post periods are as follows: Alameda, 7,422 (Pre) and 9,970 (Post); Contra Costa, 6,000 (Pre) and 1,972 (Post); Fresno, 10,154 (Pre) and 5,833 (Post); Kern, 4,597 (Pre) and 4,156 (Post); Los Angeles, 141,112 (Pre) and 37,279 (Post); Riverside, 12,152 (Pre) and 7,334 (Post); San Bernardino, 18,324 (Pre) and 13,054 (Post); San Francisco, 5,318 (Pre) and 4,117 (Post); San Joaquin, 4,787 (Pre) and 5,803 (Post); Santa Clara, 10,597 (Pre) and 4,746 (Post); Stanislaus, 6,343 (Pre) and 2,292 (Post); Tulare, 7,175.

[b] Total months in the observed Pre and Post periods correspond to carve-out dates for each county. All Tulare County months are treated as Pre period.

** Test of equality of means, $p < 0.05$

↓ and ↑ denote significant differences using 95 percent confidence intervals

Pre and post carve-out percentiles by Two Plan county

Mean per claimant expenditures generally showed a consistent pattern across the Two Plan counties. The mean expenditure declined in the mandatory group for all counties (significantly for all but San Bernardino and Stanislaus). No change was found for Stanislaus, Riverside, or San Joaquin in the non-mandatory group. An increase occurred in only one county (Fresno) and only in the non-mandatory group.

In contrast, the percentiles suggested some differences across counties. The measure of 10th percentile per claimant expenditures showed mixed changes in the Two Plan counties. The 10th percentile of expenditures appeared to be lower after the carve-out for several counties including Fresno, Kern, Riverside, and San Bernardino. However, it did not change for several counties and appeared to increase for San Francisco, Santa Clara, and Stanislaus counties. In the non-mandatory group, an increase or no change was found for these counties.

The 25th percentile of log expenditures appeared to decline or remain stable for the mandatory group in approximately eight of the 12 Two Plan counties between the pre and post carve-out periods. The 25th percentile appeared to be more stable for the non-mandatory group. For this group, most individual counties showed no significant change or a slight decline. Declines in monthly per claimant expenditures were apparent in most Two Plan counties for the median and the 75th and 95th percentile measures, for both mandatory and non-mandatory groups. Only two counties (Los Angeles and Santa Clara) did not have a significant change in the median for the mandatory group

Two of the counties—Santa Clara and Stanislaus—did not have lower per claimant expenditures at the 25th percentile and at the median as identified for all other Two Plan counties. This suggests that for these counties, increased expenditures per claimant occurred for relatively low cost services and/or increased claimant volume occurred among children with low monthly costs. No change in median per claimant expenditures for Santa Clara, and higher median per claimant expenditures for Stanislaus, suggests either fewer low-cost claimants or greater volume of claimants around the median expenditure level.

Earlier findings showed that Santa Clara County had a modest increase in monthly claimants following carve-out implementation (**Table 5.10**). However, no changes for total monthly expenditures were found (**Table 6.7**). Results from percentiles of per claimant expenditures help to explain these earlier findings. Results in **Table 6.15A** provide some evidence of higher 10th and 25th percentile per claimant costs. No pre-post change was evident for the median while the 75th percentile cost appeared lower in the post carve-out period. Trends over the study period for mandatory and non-mandatory groups also are provided for Alameda and Kern counties. These figures suggested lower post carve-out period mean, 75th percentile, and median for mandatory but not non-mandatory groups. Percentiles in **Table 6.15A** and **Table 6.15B** suggested a larger pre-post mandatory group difference. Fresno was atypical in showing increased values for upper percentiles (in the non-mandatory group only).

Together these patterns are consistent with increased claimant participation at the lower tail of the cost distribution for all Two Plan counties, and a higher median in Santa Clara for both groups.

Multivariate Analysis of Changes to Expenditure Distribution

Multivariate analysis accounts for secular changes that could affect the distribution and/or that could affect total per claimant costs across the distribution. Quantile regression was used with independent variables that included program variables of Medi-Cal enrollment and PHP participation; season and year dummies; and MCP participation or the pre-post carve-out indicator. The dependent variable was per claimant monthly expenditure within the expansion county. Unlike previous analyses, the unit of analysis is the per individual expenditure for a claimant, and thus expenditures for "claimant-months" rather than "county-months" are examined. The multivariate analysis examined the pre and post period differences separately for claimants in the mandatory and non-mandatory groups. These comparisons use monthly figures for each county, managed care group, and month. Results for the mandatory group in several counties using the continuous MCP participation variable were evaluated (data not shown).

Several differences were evident between mandatory and non-mandatory groups in the three counties evaluated (Alameda, Kern, Santa Clara) (data not shown). Two of the three counties (Alameda and Santa Clara) showed a mandatory group decline in the 25th percentile and the 75th percentile that was associated with MCP participation. Two counties (Alameda and Kern) had declines for the 50th percentile that were associated with the rate of managed care participation. Only Santa Clara indicated an effect for the 95th percentile, where a decline was indicated. Declines in 25th percentile and median per claimant expenditure found in the mandatory group were not found in the non-mandatory group. None of the three counties showed changes in the percentiles that were associated with managed care participation rates, for the non-mandatory group, with the exception of a lower 95th percentile of per claimant expenditure in Alameda County. Mean per claimant expenditures also were not associated with managed care participation rates in the non-mandatory group, whereas increased participation was associated with lower means in the mandatory group for two of three counties.

Thus in summary, the mean as well as the 25th, median, and 75th percentile of expended per claimant declined for the mandatory group in these counties. For the non-mandatory group, percent managed care participation was generally not associated with percentile values.

In summary, the percentiles of per claimant expenditures may illustrate how the carve-out affected the distribution of claimant costs. Change in the lower percentiles depends in part on the monthly costs of the additional monthly claimants and where they rank with respect to other monthly claimants. An increase in the lower tail of the distribution, or no change in the lower tail but a downward shift in the upper percentiles, was expected as the (hypothesized) volume of lower cost claimants increased. Results indicate lower per claimant expenditure at the 25th percentile that was associated with MCP participation for the mandatory group in Two Plan counties. Median and 75th percentile claimant expenditures for the mandatory group appeared to be lower after the carve-out. This was consistent

with the expectation that higher volume of post-carve-out claimants in the lower tails of the cost distribution would lower the claimant cost at the median and upper tails of the distribution. The carve-out did not appear to change the distribution within the non-mandatory groups. The distribution changes for the mandatory group could be explained by an independent time trend of declining per claimant expenditure.

Distribution of Expenditures in Non-Expansion Counties

Figure 6.3 and **Figure 6.4** depict measures of the distribution in the 36 non-expansion counties combined. These figures suggest little change over the study period in the lower quartiles but apparent decline in the median and 75th percentile values. Multivariate regression was used to examine trends over the study period for the eleven (11) non-expansion counties, while accounting for Medi-Cal program characteristics of total enrollment and PHP participation (data not shown). To facilitate comparison with Two Plan county findings, the Two Plan county definitions for mandatory and non-mandatory participation were used to stratify claimants in the non-expansion counties. Results for claimants were grouped based on whether they would be mandatory participants if residents of a Two Plan county.

The year dummy variables indicate whether changes to the location of the quartile values changed over the study period. The results for the mandatory group indicated more substantial change in 1996 and in 1997 relative to 1994 that did the results for the non-mandatory group. For the mandatory group, significantly lower per claimant expenditures were evident in the mean as well as the 25th, median, and 75th percentiles for years of 1996 and 1997, relative to the baseline year of 1994. (These estimates were based on 16,316 "claimant-months"). These declines took place during the same period that MCP participation was increasing in the Two Plan counties for the mandatory group. Median and 75th percentile per claimant expenditures also were lower for 1995 relative to 1994. The non-mandatory group showed some slight declines but of a lower magnitude than the mandatory group. (Non-mandatory group estimates were based on 36,511 "claimant-months".) No change in mean per claimant expenditures was found. The 25th percentile per claimant expenditure was significantly different (indicating a decline) for all years relative to 1994. The median was lower in 1995 and 1996 only, the 75th percentile was lower in all years, and the 95th percentile was lower only in 1997 relative to the baseline year. Finally, as with the Two Plan counties, there was little association between total Medi-Cal enrollment and the quartile values.

Summary of Findings for Distribution of Expenditures

Little change was evident for the non-mandatory group in the Two Plan expansion counties. For the mandatory group, the carve-out was independently associated with lower 25th percentile expenditures. Median and 75th percentile claimant expenditures for the mandatory group also appeared to be lower after the carve-out. This was consistent with the expectation that higher volume post-carve-out claimants in the lower tails of the cost distribution would lower the claimant cost at the median and upper tails of the distribution. However, this finding could also be explained by an independent time trend of declining per claimant expenditure.

Figure 6.3 – Distribution of per claimant expenditures—Percentiles by month in 11 non-expansion counties (CCS independent program county, or matched urban-rural score) combined, mandatory managed care group
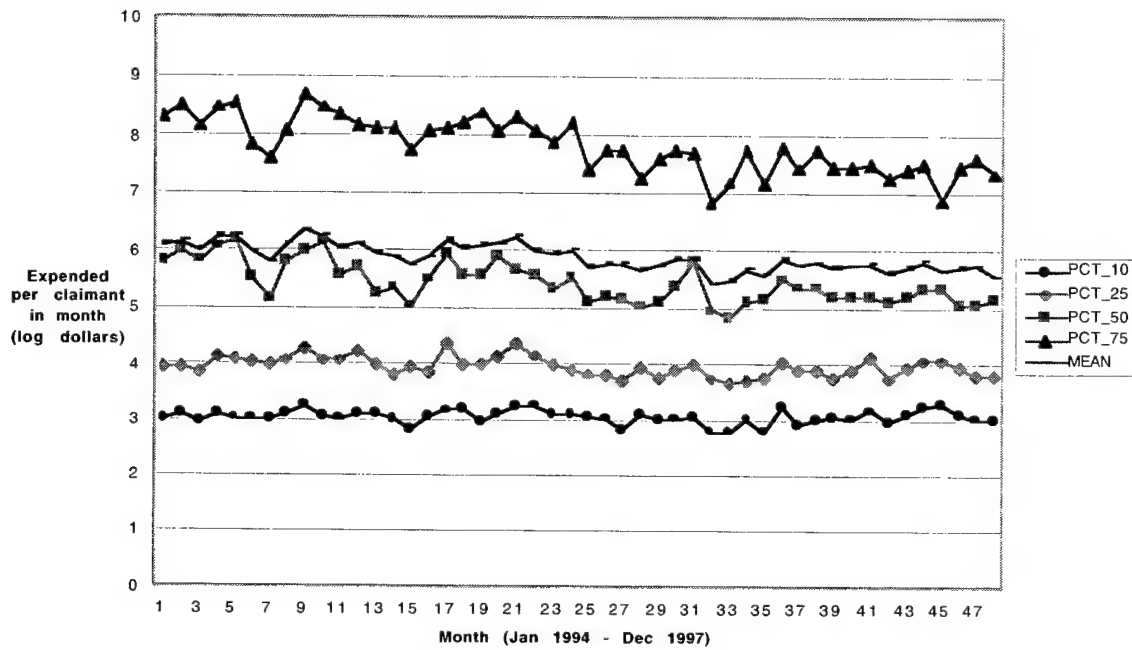
Figure 6.4 – Distribution of per claimant expenditures—Percentiles by month in 11 non-expansion counties (CCS independent program county, or matched urban-rural score) combined, mandatory managed care group
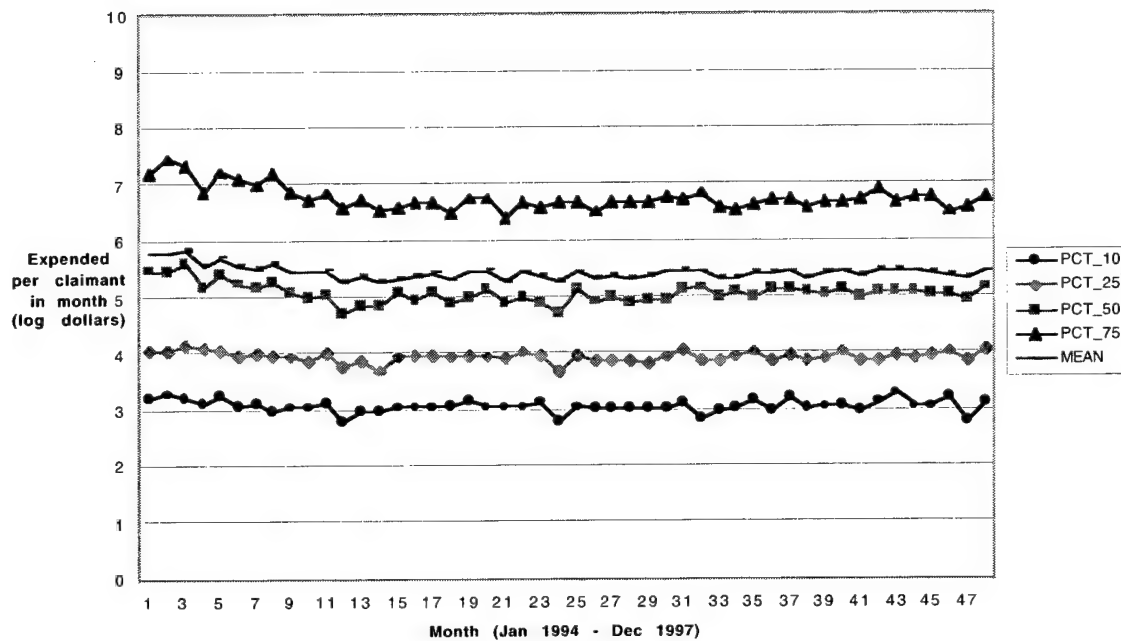
6.5   Stratification of Total CCS Expenditures By Claim (Provider) Type

Earlier results showed that total expenditures tended to decline statewide over the study period with no marginal, independent increase in expenditures associated with carve-out implementation. If trends for inpatient service expenditures dominate, then these trends could mask carve-out impact on expenditures for other types of services. Moderate declines in inpatient expenditures could mask any incremental increases in expenditures per claimants that occurred for services comprising a smaller proportion of CCS-authorized expenditures, such as ambulatory services or pharmaceuticals. Thus trends in expenditures by provider type were examined by county and managed care group to evaluate whether MCP participation was associated with expenditure patterns within certain types of provider types.

This section addresses the following questions. Did expenditures for ambulatory services and for pharmaceuticals increase for the Two Plan and COHS expansion counties? Did expenditures per claimant change for particular service types? Did intensity of expenditures change among those having at least one claim of a particular type? Did the associations hold for both mandatory and non-mandatory groups? Did the relationship hold when compared to non-expansion counties? Were independent effects of the carve-out/managed care expansion found in addition to time trends (as captured by year effects)? Did the associations hold when expansion and non-expansion counties are compared, or does a common statewide trend explain any changes that are found? How do effects for the Two Plan counties compare to effects for the two COHS expansion counties?

The following section (**6.5.1**) describes the rationale for evaluating expenditure patterns by provider type, along with the general hypotheses, the measures of effect, and the approach. Total monthly expenditures were evaluated to capture impact of CCS authorization volume. The measure of total expended per total monthly claimants was used to evaluate how the relative use of services by provider type changed for claimants over the study period. Results for these measures are provided in section **6.5.2**. For these key outcomes, results are provided for both Two Plan and COHS counties. Section **6.5.3** describes changes to caseload composition with respect to the types of services authorized. Volume of monthly claimants receiving authorizations for the given provider type also was evaluated. Another measure examined how expenditures changed among recipients of the service categories. Finally, the proportion of all claimants receiving the given service type was evaluated. This section describes the association of MCP participation with the volume of claimants; the mean expenditure per recipient (to capture service intensity); and the proportion of claimants receiving services of a particular provider type. Implications of the findings are summarized in section **6.5.4**.

6.5.1   Rationale and Hypotheses

Inpatient expenditure patterns are expected to dominate the expenditure measures that use total CCS expenditures rather than expenditure subtotals by provider type, or claimant activity by provider type, as outcomes. The claims data illustrate the significance of inpatient services as a proportion of CCS-authorized Medi-Cal expenditures. Inpatient services comprise approximately 83.4 percent of CCS-authorized payments in the study period. The remaining claim expenditures

are those services that were provided in an inpatient setting but billed separately by physicians, and all services in non-inpatient settings. Thus hospital inpatient expenditures were examined separately from expenditures in other settings. The other expenditures were further disaggregated by provider setting and type. This categorization distinguished physician services in ambulatory settings from those provided in inpatient settings, and also differentiated hospital outpatient services, and pharmaceuticals.

Ambulatory services Physician ambulatory services were expected to increase with the carve-out implementation. This hypothesis stems from the cost-shifting incentives and the fact that ambulatory services may be most likely to be accessed by any newly identified CCS claimants. Examples include certain diagnostic and evaluation services, and ambulatory care that is marginally related to a CCS eligible diagnosis. Such services also might increase over the study period independent of the carve-out effect, due to exogenous practice pattern changes from inpatient to ambulatory care settings for some services, for example. Hospital outpatient services were expected to show the same pattern as physician ambulatory services. Physician services in an inpatient setting were expected to increase in part due to the same cost-shifting incentive but also due to possible increased recognition on the part of Medi-Cal field offices of potentially CCS related services.[75] Authorization of pharmaceuticals by CCS was expected to increase with the carve-out. Pharmacy also was expected to increase as an independent time trend due to a greater CCS role with drug authorization in the post-1995 time period (Coopers & Lybrand 1997).

Hospital inpatient services There may be increased authorization by CCS of inpatient stays. However, a significant carve-out impact on hospital inpatient expenditures was not expected. Most inpatient stays would likely have been referred to CCS during the pre carve-out period. (Moreover, inpatient services are the largest component of total monthly expenditures, and total expenditures were not found to be associated with MCP participation.) Similarly, little effect on total rehabilitation facility expenditures was expected. It seems likely that children receiving such services would already be known to CCS, and also that such services would be more readily identified as CCS-related.

Several measures other than total monthly expenditures by provider category were evaluated. One measure captures expenditures by provider type per total monthly claimants irrespective of the type of service received by those comprising the denominator. Overall, expenditures per total monthly claimants were expected to decline with carve-out implementation due to compositional changes to the CCS caseload. However, expenditures per monthly claimants for ambulatory physician services, outpatient hospital services, and pharmaceuticals may increase with the carve-out depending on (1) the service use patterns of the newly referred children, and (2) the patterns of service for which CCS becomes involved in the post carve-out period. Expenditures per total claimants may have declined for rehabilitation facilities as the carve-out was implemented, if changes to the composition of the CCS caseload result in a greater percentage of monthly claimants having only diagnostic services or

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[75] There may be an independent effect over time that results from changing patterns with such physician inpatient services being billed separately from other inpatient services, although there is no specific evidence that such a trend occurred during the study period.

treatment for less severe (implying less cost-intensive) diagnoses. Any positive effect on rehabilitation facility expenditures would likely be attributable to Medi-Cal field office authorization practices rather than increased rates of referral to CCS on the part of physicians or the health plans. As noted in discussing the total expenditures measure, children receiving rehabilitation services may be more likely than other CCS eligible children to have been known to CCS in the pre carve-out period. However, if a significant amount of rehabilitation facility expenditures, or certain children receiving these services, bypassed the CCS authorization process in the pre carve-out period, a post carve-out increase in monthly expenditures could occur.

There is some ambiguity in the hypotheses for per claimant expenditures. It is possible that for a given provider type, the carve-out increased per claimant authorizations for a specific type of service (causing expenditures per claimant to increase) but also increased the number of low-utilizing claimants who would have few authorizations for the service (potentially causing expenditures per claimant to decline).

A measure of <u>total monthly CCS recipients for each type of service category</u> helps to clarify the mechanisms for the carve-out impact. The claimant volume measure shows whether the expenditure measures are affected by changes in claimant volume or whether they are only affected by greater average expenditure among (existing) recipients. It is sensitive to increased claimant activity for a given type of service, even if total expended does not change. Another measure was <u>expenditures per recipients of a given provider type service</u>. This measure captures any change in per claimant expenditures among those receiving that type of service. For example, following the carve-out, CCS might authorize more services related to an inpatient stay that in the pre-carve-out period might have been authorized in part by CCS and in part by a Medi-Cal office. CCS also could become involved in authorization earlier in an inpatient stay, such as for a newborn's NICU stay where CCS eligibility depends on meeting certain health status criteria rather than on diagnosis. These are examples in which intensity among recipients could show an effect, while total recipients or total expended across all claimants might not change because CCS was already involved in some way. (A claimant is counted as a recipient only once per observation, i.e. month).

Despite limitations to each measure, taken together these measures provide some insight into whether more children are receiving services within each type, and whether lack of effect for total expenditures is because the marginal effect is not large enough to affect the totals. Ideally, patterns in those specific services that were expected to increase with the carve-out would be evaluated separately. An example is diagnostic services. However, estimates of expenditures for these services are difficult to glean from Medi-Cal claims data, which use a combination of CPT codes and several other coding systems in reporting expenditures by procedure or service type. Consequently a more general approach to categorizing services by provider type was undertaken.

Claim information on provider type and location of service was used to estimate total expenditures per provider type category. Expenditures were categorized into eight groups. The categories along with the total statewide CCS-authorized expenditures associated with each category over the study period are as follows: (1) ambulatory physician services (i.e., those in office, outpatient, home, or

emergency department settings) (1.1 percent of expenditures); (2) physician services in inpatient settings (2.3 percent of expenditures); (3) physician services in other settings (0.1 percent of expenditures); (4) pharmacy including medical supplies (5.6 percent of expenditures); (5) outpatient hospital services (2.1 percent of expenditures); (6) inpatient hospital services (83.4 percent of expenditures); (7) rehabilitation hospital services (4.7 percent of expenditures), and (8) all other services (0.7 percent of expenditures).[76]

Physician services in office, outpatient, emergency department, and home settings form one category of services in ambulatory care settings. Hospital outpatient services form the other category of ambulatory services. Excluding from the physician ambulatory service and physician inpatient service categories those physician services provided in "other" unidentified settings was not expected to affect total expenditures in the other two groups. These services were distinguished from those in the other two groups to aid in the interpretability of findings for the ambulatory and inpatient physician services.

While the service type categories are useful in distinguishing whether patterns differ for ambulatory services, pharmaceuticals and medical supplies, and inpatient services, this classification approach does have certain limitations. Contracting hospitals negotiate their rates with the California Medical Assistance Commission (CMAC) and do not provide the same level of detailed, itemized claims information on procedures as provided in other CCS-authorized claims. In addition, for some services

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[76] Group 1 includes physician and physician group claims in an office, outpatient, home, or ER setting. Of Group 1 expenditures by setting, 47.8 percent were outpatient; 34.8 percent were office, clinic, or laboratory; 15.1 percent were home; and 2.2 percent were emergency department. Group 2 includes physician and physician group claims in an inpatient setting. Group 3 includes physician and physician group claims in any other setting. The majority of Group 3 expenditures were physician group services (75.3 percent). Relatively few expenditures were in this non-classifiable physician service category, with mean of $140 monthly for the non-mandatory group in Two Plan counties, and $549 monthly for the mandatory group in Two Plan counties. Group 4 includes all claims from a pharmacy vendor. Group 5 includes all non-physician/physician group claims in an inpatient setting. Of Group 5 expenditures by vendor type, 91.9 percent were in (unidentified) contract hospitals; 7.4 percent were in non-contract community inpatient; and 0.7 percent were in non-contract county inpatient hospitals. Group 6 includes all non-physician/physician group claims in an outpatient setting. Of Group 6 expenditures by setting, 69.8 percent were in community hospitals, 19.9 percent were in county hospitals, and 9.1 percent were in community hospital renal dialysis centers. Group 7 includes all non-physician/physician group claims in a rehabilitation hospital setting. Of Group 7 expenditures by vendor type, 80.2 percent were in an independent rehabilitation facility; 19.2 percent were in a community hospital rehabilitation facility; and 0.6 percent were in a county hospital rehabilitation facility. Of Group 7 expenditures by setting, 61.5 percent did not have a reported setting; 20.6 percent were in an office, lab or clinic; and 17.9 percent were in an outpatient setting. Group 8 includes all other claims. Of Group 8 expenditures by vendor, 67.8 percent did not have a reported provider type; 12.0 percent were home health; 8.3 percent were prosthetist; and the remaining expenditures were from 36 different vendor types. Of Group 8 expenditures by setting, 74.8 percent had coding indicating in home services, and 22.4 percent were in office, lab, or clinic settings. Counts of claim segments (generally analogous to unique procedures within a particular claim) were used to characterize the volume of services within Group 8 claims. Using claim segments, this last group was found to be comprised of unidentified provider types (60.2 percent of the total segments), home health (16.5 percent), prosthetics and orthotics (5.9 percent combined), audiologist (3.8 percent), medical transport (1.9 percent), clinical lab (1.9 percent), and several other provider types.

(specifically, rehabilitation services) in several counties, expenditures and total claimants appeared to peak in the first month of the quarter and drop for the next two months in the quarter. While some specialty care center care coordination services are billed quarterly, dates would be expected to correspond to service delivery dates, so the cause of this peaking effect is not clear. It also is important to note that rehabilitation services are not necessarily distinguishable from other inpatient (or outpatient) services when provided within contract hospitals. Similarly, pharmacy services are combined into one category irrespective of the setting; those provided within a negotiated rate in contracted hospitals will not be classified with other pharmacy services. Finally, in examining trends by county, it is important to note the possible reasons for differential carve-out response and impact. Each county likely has a different mix of county, community, and outpatient facilities that serve children with CCS eligible medical diagnoses, and likely a different mix of office-based physicians who treat CCS eligible diagnoses. It would be necessary to examine characteristics of each county's delivery system separately to better formulate hypotheses and to interpret county-level variability in the results.

The detailed "segments" of the paid claims were the source of the vendor information necessary to assign provider type. While the summary "header" of a claim was used for other expenditure analyses in this study, this part of the claim does not include information about the provider or the setting where services were provided. There were small differences between total expenditures as determined by (1) summarizing claims header data as in previous analyses, and (2) summarizing total payments from the detail segments that have provider and procedure codes. For example, in Alameda County the total for summarized segments was 0.83 percent higher than the expenditure total indicated by the claims header summaries.[77] There is no known reason to expect that this difference varies by any characteristic relevant to the study outcome, such as by county or by month in the study period.

As in previous analyses, expenditures were aggregated monthly at the county level, and aid categories were pooled into mandatory and non-mandatory groups. Some counties had zero expenditures, and thus zero expenditures per total monthly claimants, for some months.[78] This occurred most frequently for physician ambulatory services. Of 2,208 Two Plan and eleven non-expansion counties "county-months", it occurred in 37 mandatory and 24 non-mandatory county-months for physician ambulatory services, and in 49 mandatory and 3 non-mandatory county-months for pharmaceuticals.

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[77] Documentation for Medi-Cal claims files indicates that such small differences are expected and that they result from "third party payments or other adjustments".

[78] Tabulations of monthly expenditures for the Two Plan and the eleven non-expansion counties showed some occurrences of net negative monthly expenditures, for some provider types. This occurred most frequently for physician ambulatory services and almost exclusively among the eleven non-expansion counties. For the mandatory aid categories group, net negative expenditures occurred in four (4) counties and in a total of nine (9) of the total 1,104 months. The mean monthly expenditure for such months was -$66 (s.d. $51). This occurred in three (3) months in years 1994 or 1995 (the pre carve-out period) and in six (6) months in years 1996 or 1997 (when Two Plan counties were transitioning to managed care). For the non-mandatory aid categories group, net negative expenditures occurred in three (3) counties in a total of four (4) months, with one in 1995 and three in 1996. The mean monthly expenditure for such months in the non-mandatory group was -$26 (s.d. $3). Monthly expenditures were set to zero for any county-month in which net negative expenditures were found.

6.5.2 Expenditures by Type of Provider

Results for two measures are presented in this section. The first measure is total monthly expenditures for the given provider type. The second measure is expenditures per total monthly claimants. This section describes annual trends in expenditures by provider type. This is followed by pre-post carve-out bivariate results for the Two Plan and COHS expansion counties. The section concludes with results from multivariate specifications of carve-out effect.

Trends by Year for Two Plan, COHS, and Non-Expansion Counties

Annual means for total monthly CCS expenditures by provider type were evaluated for the 36 non-expansion counties, and for the Two Plan and COHS expansion counties. Annual means can be compared directly for expansion and non-expansion counties. In contrast, pre-post carve-out comparisons would be unique to each expansion county's effective dates. An important question was whether total monthly expenditures changed over the study period for the non-expansion counties. A second question is whether the timing and types of any changes were consistent with what was expected in the expansion counties, and whether annual trends were similar for expansion and non-expansion counties. Similar trends would indicate either no independent carve-out effect, or a carve-out effect that extended beyond the target counties.

Annual means for the 36 non-expansion counties are provided in **Table 6.16, Annual mean monthly expended by provider type: Pooled 36 non-expansion counties, by mandatory managed care group (using Two Plan definition)**. Mean comparisons in this table show which study years differ significantly from the mean for the particular provider type in calendar year1997. This year was selected for comparison because it is the year in which most Two Plan and COHS counties were partially or fully implemented. Results for the 36 non-expansion counties showed larger expenditures in 1997 relative to early study period years for physician services in ambulatory settings.[79] This pattern appeared to hold for both mandatory and non-mandatory groups. For example, pooling all 36 non-expansion counties, mean monthly ambulatory physician expenditures for 1996 and 1997 showed an increase from $32,948 to $53,493 for the mandatory group, and an increase from $46,234 to $73,242 for the non-mandatory group. Pharmaceuticals also appeared to be higher for the mandatory group in 1997 relative to earlier years ($79,787 from $54,369 in 1996) with little change between the earlier years. The annual monthly means indicated a more gradual increase over time for the non-mandatory group. For the non-mandatory group, absolute differences between monthly means for these years were as follows: an increase of $88,251 from 1994 to 1995; $84,332 from 1995 to 1996; and $12,945 from 1996 to 1997.

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[79] As discussed in Chapter 4 and in Appendix B, physician expenditures may be underestimated for late calendar year 1995 and early 1996 due to apparently missing original claims. This occurred statewide. However, this was found to occur more frequently and with a slightly greater impact for expenditures in the mandatory group.

Table 6.16 – Annual mean monthly expended by provider type: Pooled 36 non-expansion counties, by mandatory managed care group (using Two Plan definition)

Managed Care Group [a] and Year [b]	Physician Services (Office, ER, Outpatient, Home) Mean (s.e.)	Physician Services (Inpatient) Mean (s.e.)	Pharmacy and Medical Supplies Mean (s.e.)	Hospital Services (Inpatient) Mean (s.e.)	Hospital Services (Outpatient) Mean (s.e.)	Rehabilitation Facility Mean (s.e.)	Other Services [c] Mean (s.e.)
Mandatory							
1994	$27,267** (3,476)	$40,172 (2,894)	$57,261* (4,522)	$2,168,322* (65,889)	$23,718 (1,759)	$2,819** (311)	$25,904* (2,185)
1995	$27,503** (2,261)	$35,110 (1,548)	$56,706* (6,791)	$2,260,150** (60,008)	$20,373** (1,013)	$5,071 (211)	$30,037 (2,092)
1996	$32,948** (3,693)	$32,706 (1,741)	$54,369** (3,674)	$1,899,615 (76,513)	$26,370 (1,528)	$5,375 (424)	$39,624 (3,850)
1997	$53,493 (5,292)	$34,194 (1,866)	$79,787 (8,410)	$1,895,854 (66,336)	$26,867 (1,865)	$4,576 (257)	$36,615 (2,881)
Non-Mandatory							
1994	$46,430** (3,561)	$39,221 (2,304)	$147,150** (12,381)	$1,484,283** (61,739)	$49,463** (4,983)	$12,696** (2,823)	$141,498** (8,838)
1995	$37,860** (2,753)	$34,365** (2,572)	$235,401** (17,221)	$1,669,587 (65,315)	$39,953** (1,456)	$27,884 (1,588)	$157,591** (6,912)
1996	$46,234** (3,369)	$40,880 (3,035)	$319,734 (22,554)	$1,790,842 (59,631)	$49,286** (2,156)	$31,512 (1,533)	$209,831 (7,371)
1997	$73,242 (4,369)	$46,445 (3,087)	$332,678 (9,511)	$1,833,239 (52,640)	$69,334 (5,119)	$32,306 (1,531)	$224,946 (9,754)

[a] As no managed care requirement applies in the 36 non-expansion counties, mandatory group classification refers to status that would apply to aid eligibility categories if residing in Two Plan counties

[b] N=12 for each year

[c] Includes all other services with the exception of any non-categorized services identified as physician services

* Test of equality of means, referent year versus 1997, Scheffe adjusted for multiple comparisons, $p < 0.10$, $F(3,44)$

** Test of equality of means, referent year versus 1997, Scheffe adjusted for multiple comparisons, $p < 0.05$, $F(3,44)$

Little change was indicated for physician inpatient services. None of the annual means differed from the 1997 mean for the non-mandatory group, and in the non-mandatory group, only 1995 was significantly different (lower) from the 1997 mean. Hospital inpatient service expenditures were lower in 1997 and 1996 relative to 1995 and 1994 for the mandatory group, but an increasing annual trend was suggested for the non-mandatory group (with a statistically significant difference between 1997 and earlier years for 1994 only). Hospital outpatient service expenditures appeared to increase between 1996 and 1997 while remaining steady for earlier years in the non-mandatory group; this late study period increase was not apparent for the mandatory group.

For the mandatory group, about half of the Two Plan counties showed the same significant shift as the 36 non-expansion counties for ambulatory physician services between 1996 and 1997 (data not shown). For example, monthly expenditures tripled for Fresno from $7,305 in 1996 to $21,470 in 1997. This shift between 1996 and 1997 was found for only three (3) counties for the non-mandatory group. For this group, a higher 1997 mean expended compared to 1994 and 1995 occurred for about half of the counties. Thus both mandatory and non-mandatory groups showed increases in many Two Plan counties though more of the mandatory group showed 1996 versus 1997 differences. Such differences might be expected because most Two Plan implementation dates fell within this time period. For pharmaceuticals, eight (8) or nine (9) counties in both mandatory and non-mandatory groups showed higher 1997 means relative to 1994 and to 1995. Fewer counties indicated differences between 1996 and 1997 (the implementation years).

Unlike the non-expansion counties, higher physician inpatient expenditures were often found for both mandatory and non-mandatory groups in 1997 relative to earlier years of 1994, of 1995, and of 1996. Hospital inpatient services declined in several counties for the mandatory and non-mandatory groups, but there were few changes in annual monthly means. Fresno and Kern were exceptions in showing increased expenditures in 1997 relative to earlier years. Outpatient expenditures were similar to trends for ambulatory physician services in the mandatory group. In contrast, mean monthly 1997 expenditures differed from earlier years for the non-mandatory group in only a few counties. Thus outpatient expenditure trends were somewhat consistent with findings from 36 counties for the non-mandatory group. However, in those counties, there was no mandatory group increase between 1996 and 1997 as occurred in half of the Two Plan counties.

Annual means for the two COHS expansion counties (data not shown) are not directly comparable to the 36 county means reported above, which use the Two Plan county definition of mandatory status. (The multivariate results reported in the next section for the pooled COHS and non-expansion counties use a common definition, which is the definition operating in COHS counties). The mandatory group in COHS counties began enrollment at the end of 1995 and reached close to 100 percent MCP participation by January 1996 (Santa Cruz) and February 1996 (Orange). Annual means suggested a large shift in ambulatory and inpatient expenditures between 1995 and 1996 but little change between 1994 and 1995, or between 1996 and 1997. For example, mean monthly physician ambulatory services for the COHS counties (24 observations per year) were $13,631 in 1994; $10,629 in 1995; $28,230 in 1996; and $32,061 in 1997. Physician inpatient and hospital outpatient expenditures showed the same pattern. Pharmaceutical expenditures also did not change

between 1994 and 1995 but were higher in 1996 and still higher in 1997. While mean monthly expenditures doubled from $54,896 in 1995 to $106,271 in 1996, high standard errors due to combining means from Orange and Santa Cruz counties (rather than combining expenditures) resulted in a statistically insignificant difference (p=0.25). Independently each COHS county showed no change between the two largely pre carve-out years but large differences between calendar years 1995 and 1996, and between 1996 and 1997. Thus COHS counties showed little change in annual mean monthly expenditures in most provider types between the two pre carve-out years, but showed large differences between the pre carve-out and post carve-out years.

In summary, for the mandatory group in the 36 counties, the categories indicating expenditure changes in the years around the expansion county carve-out implementation period were physician ambulatory services and pharmaceuticals (both increasing) and hospital inpatient services (with a decline). Although only four calendar years are examined, all three of these categories appeared to indicate a level shift between 1996 and 1997 rather than a steady, increasing time trend from 1994 onward. A similar pattern occurred for the non-mandatory group in physician ambulatory expenditures and for hospital outpatient expenditures, which both showed increases. However, the increase in pharmaceuticals was apparent for each year of 1994 through 1996, and the only significant difference in mean monthly hospital inpatient services between 1997 and earlier occurred for the mandatory group for 1994 and 1995, and for the non-mandatory group occurred for 1994 versus 1997.

Thus in the 36 non-expansion counties, findings for the group that would be mandated to participate in managed care if residing in a Two Plan county were consistent with the carve-out impact hypothesized for expansion counties. Providers in these 36 counties were not subjected to the cost-shifting incentives that were in place in the expansion counties. The group comprised of the "non-mandatory" aid categories shared some of the trends but tended to show more gradual expenditure shifts that also appeared to start in the pre carve-out period.

One reason that similar patterns could occur (though of greater magnitude in the COHS than the non-expansion counties, in particular) is common changes that are unrelated to the carve-out. Another explanation for these bivariate findings is that non-expansion counties experienced indirect effects of the carve-out that stemmed from the expansion underway in other counties. Specifically, any authorization practice changes on the part of the Medi-Cal field offices (and CCS offices) could extend to all counties in the region whether an expansion or non-expansion county. As indicated in Chapter 3, each field office region includes both expansion and non-expansion counties. While this makes the non-expansion counties less appropriate as a comparison group if true, such effects are plausible and are consistent with some CCS administrator reports, as discussed in Chapter 7.

Table 6.17A – Pre and Post carve-out mean monthly expended by provider type (Physician office, Physician inpatient, Pharmacy): Two Plan and COHS expansion counties, by mandatory managed care group

Expansion County	Months in Period N Pre	Months in Period N Post	Physician Services (Office, ER, Outpatient, Home) Non-Mandatory Pre	Non-Mandatory Post	Mandatory Pre	Mandatory Post	Physician Services (Inpatient) Non-Mandatory Pre	Non-Mandatory Post	Mandatory Pre	Mandatory Post	Pharmacy and Medical Supplies Non-Mandatory Pre	Non-Mandatory Post	Mandatory Pre	Mandatory Post
Alameda	24	24	$7,585	$12,089 **	$5,806	$9,340 **	$22,696	$29,299 **	$51,079	$54,540	$54,898	$73,812 **	$16,376	$21,288 *
			(445)	(1,345)	(506)	(776)	(1,407)	(1,457)	(3,754)	(3,113)	(1,846)	(1,954)	(1,514)	(1,921)
Contra Costa	37	11	$4,090	$4,944	$2,187	$4,423 **	$11,490	$9,680	$17,826	$20,995	$59,446	$95,255 **	$5,597	$8,531 **
			(347)	(519)	(172)	(777)	(924)	(1,045)	(1,224)	(2,162)	(5,040)	(8,038)	(430)	(1,118)
Fresno	34	14	$5,463	$19,145 **	$5,754	$17,612 **	$8,177	$16,052 **	$5,361	$35,371 **	$87,814	$158,871 **	$14,992	$21,818 **
			(718)	(2,526)	(941)	(3,326)	(824)	(2,131)	(628)	(5,239)	(4,603)	(8,420)	(1,176)	(2,127)
Kern	30	18	$5,811	$18,674 **	$2,482	$9,830 *	$6,751	$18,065 **	$7,010	$37,229 **	$59,315	$65,289	$6,147	$15,526 **
			(1,600)	(4,422)	(208)	(1,142)	(605)	(2,290)	(601)	(3,871)	(3,446)	(5,306)	(760)	(1,602)
Los Angeles	39	9	$92,504	$93,515	$73,798	$52,587 **	$219,025	$242,112	$203,347	$172,208 *	$508,981	$852,617 **	$181,528	$198,995
			(2,243)	(10,322)	(2,806)	(7,115)	(7,560)	(15,157)	(7,398)	(13,912)	(21,385)	(30,847)	(9,063)	(18,554)
Riverside	32	16	$5,177	$10,347 **	$5,174	$6,845 **	$14,008	$19,132 **	$11,986	$15,395	$95,499	$148,778 **	$21,402	$19,201
			(317)	(768)	(324)	(660)	(927)	(1,094)	(1,159)	(1,808)	(3,818)	(6,081)	(1,504)	(838)
San Bernardino	32	16	$8,871	$16,762 **	$8,962	$11,220 **	$20,282	$26,518 **	$19,427	$27,232 **	$114,668	$153,333 **	$26,095	$40,220 **
			(433)	(1,030)	(510)	(413)	(1,114)	(2,085)	(1,334)	(2,482)	(3,668)	(5,802)	(1,425)	(2,075)
San Francisco	30	18	$6,225	$2,714	$3,229	$1,966 **	$9,697	$8,442	$7,791	$8,688	$42,421	$56,860 **	$2,779	$13,678 **
			(1,642)	(233)	(238)	(189)	(794)	(1,444)	(1,012)	(1,349)	(2,720)	(1,895)	(721)	(1,570)
San Joaquin	25	23	$3,990	$6,119 **	$4,581	$6,546 **	$8,777	$10,092	$10,243	$19,461 **	$47,938	$63,266 **	$2,913	$6,732 **
			(414)	(637)	(355)	(556)	(628)	(892)	(1,527)	(1,514)	(5,166)	(3,224)	(385)	(507)
Santa Clara	33	15	$5,930	$4,744 **	$6,028	$7,432 *	$15,203	$10,186 **	$13,649	$11,660	$73,139	$145,224 **	$16,350	$16,758
			(286)	(480)	(434)	(609)	(810)	(1,425)	(872)	(1,198)	(7,206)	(8,801)	(1,359)	(2,228)
Stanislaus	37	11	$2,423	$3,490 **	$2,765	$4,718 *	$4,586	$5,663	$6,056	$9,311 **	$36,596	$55,744 **	$12,340	$20,302 **
			(186)	(249)	(404)	(1,196)	(429)	(1,055)	(751)	(1,437)	(2,087)	(1,534)	(954)	(2,338)
Tulare	48	0	$2,419	–	$2,318	–	$2,839	–	$3,187	–	$71,530	–	$7,193	–
			(212)		(140)		(314)		(350)		(5,650)		(551)	
All 12 Two Plan counties[a,b]	401	175	$13,562	$14,418	$11,084	$10,331	$30,942	$27,818	$31,250	$33,248	$111,047	$137,121 *	$28,407	$27,469
			(1,330)	(1,638)	(1,075)	(933)	(3,191)	(3,925)	(2,982)	(2,892)	(7,043)	(13,172)	(2,696)	(3,263)
Orange	21	27	$5,571	$5,452	$20,929	$47,470 **	$11,828	$16,180 *	$41,976	$112,956 **	$7,321	$11,392 **	$102,257	$224,072 **
			(608)	(396)	(1,178)	(2,273)	(1,462)	(1,714)	(3,157)	(5,897)	(750)	(1,118)	(4,304)	(17,351)
Santa Cruz	24	24	$455	$973 **	$3,371	$9,453 **	$2,063	$974	$6,076	$11,261 **	$446	$558	$7,891	$38,566 **
			(76)	(134)	(292)	(607)	(866)	(262)	(1,367)	(796)	(82)	(118)	(673)	(3,040)
COHS counties[a,c]	45	51	$2,842	$3,344	$11,565	$29,579 **	$6,620	$9,024	$22,829	$65,100 **	$3,654	$6,294 **	$51,928	$136,775 **
			(478)	(383)	(1,436)	(2,950)	(1,096)	(1,406)	(3,150)	(7,825)	(623)	(965)	(7,378)	(16,011)

Total months in the observed Pre and Post periods correspond to carve-out dates for each county
[a] Means for all county-months in Pre and Post periods
[b] Mandatory and non-mandatory groups defined according to Two Plan expansion criteria
[c] Mandatory and non-mandatory groups defined according to COHS expansion criteria
* Test of equality of means (Pre vs. Post), $p<0.10$
** Test of equality of means (Pre vs. Post), $p<0.05$

Table 6.17B – Pre and Post carve-out mean monthly expended by provider type (Hospital inpatient, Hospital outpatient, Rehabilitation facility): Two Plan and COHS expansion counties, by mandatory managed care group

Expansion County	N Pre	N Post	Hospital—Inpatient Non-Mandatory Pre	Non-Mandatory Post	Mandatory Pre	Mandatory Post	Hospital—Outpatient Non-Mandatory Pre	Non-Mandatory Post	Mandatory Pre	Mandatory Post	Rehabilitation Facility[d] Non-Mandatory Pre	Non-Mandatory Post	Mandatory Pre	Mandatory Post
Alameda	24	24	$725,445	$781,414	$1,215,829	$1,037,593 **	$9,058	$13,385 **	$3,715	$7,708 **	$9,334	$12,662 **	$3,402	$2,780 *
			(26,730)	(24,519)	(42,584)	(26,539)	(1,266)	(1,295)	(826)	(632)	(722)	(465)	(251)	(161)
Contra Costa	37	11	$308,529	$269,071	$425,879	$394,261	$4,245	$4,066	$1,008	$3,575 **	$8,482	$2,410 **	$1,495	$686 *
			(14,523)	(19,439)	(22,842)	(31,185)	(520)	(644)	(105)	(384)	(1,383)	(681)	(212)	(139)
Fresno	34	14	$471,753	$694,571 **	$650,945	$845,088 **	$10,253	$15,353 *	$2,051	$13,240 **	$7,975	$10,204 **	$2,234	$2,572
			(19,026)	(28,941)	(27,912)	(32,243)	(1,663)	(2,311)	(251)	(2,026)	(518)	(347)	(148)	(192)
Kern	30	18	$408,808	$523,054 **	$645,495	$779,107 **	$4,949	$8,652 **	$2,499	$8,593 **	$218	$402 **	$211	$206
			(18,757)	(24,070)	(29,095)	(38,481)	(500)	(749)	(228)	(879)	(26)	(42)	(33)	(54)
Los Angeles	39	9	$7,634,832	$7,037,963 **	$8,438,215	$6,504,989 **	$366,461	$355,308	$205,037	$145,247 **	100,637	117,597	$20,358	$26,856 **
			(120,248)	(140694)	(178,963)	(178,122)	(7,428)	(9,287)	(5,301)	(5,034)	(8,838)	(21,804)	(946)	(2,025)
Riverside	32	16	$784,714	$874,688 *	$839,616	$814,512	$16,879	$26,414 **	$8,979	$8,437	$8,716	$7,145	$1,155	$1,176
			(30,005)	(35,749)	(20,292)	(36,423)	(1,575)	(2,693)	(1,327)	(1,036)	(1,352)	(2,117)	(175)	(166)
San Bernardino	32	16	$1,217,832	$1,258,777	$1,577,822	$1,545,593	$35,770	$40,746	$15,079	$18,815	$11,591	$26,115 **	$2,581	$2,295
			(27,762)	(39,126)	(36,266)	(66,176)	(1,979)	(2,347)	(1,302)	(2,516)	(1,738)	(1,808)	(146)	(166)
San Francisco	30	18	$340,344	$359,726	$297,327	$287,519	$15,502	$17,170	$4,929	$9,327 **	$1,606	$9,804 **	$487	$2,272 **
			(17,698)	(15,905)	(19,147)	(16,999)	(1,155)	(1,178)	(280)	(1,423)	(144)	(1,863)	(52)	(408)
San Joaquin	25	23	$286,039	$333,289	$449,413	$403,184	$8,512	$12,070 **	$2,788	$4,352 **	$3,735	$5,108 **	$400	$857 **
			(19,012)	(21,824)	(27,892)	(25,346)	(531)	(1,236)	(274)	(320)	(418)	(236)	(51)	(59)
Santa Clara	33	15	$770,404	$530,595 **	$916,628	$702,398 **	$13,034	$10,639	$7,481	$7,216	$10,366	$9,119	$2,474	$1,680 **
			(26,269)	(38,308)	(28,618)	(44,686)	(937)	(1,747)	(599)	(872)	(952)	(901)	(158)	(144)
Stanislaus	37	11	$249,491	$274,449	$424,077	$305,517 **	$6,600	$6,993	$2,197	$3,657 **	$4,477	$7,177 **	$586	$614
			(10,786)	(32,616)	(20,221)	(30,947)	(872)	(656)	(182)	(318)	(521)	(886)	(71)	(95)
Tulare	48	0	$213,164	—	$324,374	—	$3,660	—	$1,344	—	$1,081	—	$425	—
			(12,264)		(11,410)		(304)		(148)		(87)		(40)	
All 12 2 Plan counties[a,b]	401	175	$1,200,044	$933,991	$1,432,787	$1,027,120 *	$45,826	$33,326	$24,116	$15,593 *	$15,332	$14,747	$3,250	$2,946
			(107,323)	(110,432)	(117,835)	(101,371)	(5,335)	(5,767)	(3,031)	(2,350)	(1,683)	(2,184)	(307)	(452)
Orange	21	27	$675,049	$761,286	$1,856,494	$1,737,537	$6,761	$6,831	$20,167	$56,534 **	$1,898	$3,807 **	$24,546	$35,904
			(33,246)	(37,520)	(70,653)	(65,501)	(2,944)	(567)	(723)	(3,650)	(511)	(592)	(5,513)	(6,167)
Santa Cruz	24	24	$66,992	$56,914	$235,175	$222,704	$521	$713	$5,617	$8,668 **	$53	$89	$2,326	$2,352
			(6,836)	(8,171)	(14,601)	(16,966)	(103)	(254)	(494)	(848)	(12)	(25)	(302)	(240)
COHS counties[a,c]	45	51	$350,752	$429,817	$991,791	$1,024,675	$3,433	$3,952	$12,407	$34,009 **	$914	$2,057 **	$12,696	$20,114
			(48,362)	(53,611)	(126,442)	(112,594)	(1,436)	(538)	(1,173)	(3,904)	(273)	(407)	(3,044)	(4,012)

Total months in the observed Pre and Post periods correspond to carve-out dates for each county

[a] Means for all county-months in Pre and Post periods

[b] Mandatory and non-mandatory groups defined according to Two Plan expansion criteria

[c] Mandatory and non-mandatory groups defined according to COHS expansion criteria

[d] For Two Plan counties, based on 397 Pre and 175 Post months (Non-mandatory), and on 393 Pre and 171 Post months (Mandatory)

* Test of equality of means (Pre vs. Post), p<0.10

** Test of equality of means (Pre vs. Post), p<0.05

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Pre and Post Carve-Out Expenditures by Provider Type in Two Plan and COHS Expansion Counties

This section compares pre and post carve-out period expenditures on aggregate with expenditures disaggregated by provider type, for the expansion counties. Patterns for the mandatory group are the focus. Service types where non-mandatory group findings diverged also are highlighted.

Total annual expenditures had appeared to decline for the mandatory managed care group in most Two Plan and expansion COHS counties over the course of the study period (**Table 6.1**). One Two Plan county (San Bernardino) had indicated a significant negative coefficient for total expended while Santa Clara had a significant, positive coefficient. Some types of expenditures may have had different trends within the aggregated totals. Pre and post mean monthly expenditures by Two Plan county and by COHS expansion county, for ambulatory services and pharmaceuticals, are presented in **Table 6.17A, Pre and Post carve-out mean monthly expended by provider type (Physician office, Physician outpatient, Pharmacy): Two Plan and COHS counties, by mandatory managed care group** to illustrate (unadjusted) trends over the study period. Results for hospital inpatient, hospital outpatient, and rehabilitation hospital services are presented in **Table 6.17B**. In these tables, the applicable definition of mandatory status for the Two Plan or COHS model is used for the given expansion county.

Ambulatory physician and hospital services   Bivariate pre-post comparisons suggested significantly higher expenditures in the post carve-out period for ambulatory physician services (office, outpatient, or emergency department settings) in all Two Plan counties with the exception of Los Angeles and San Francisco. Expenditures also were higher in COHS counties, where the mean monthly totals more than doubled. Outpatient hospital services showed more mixed results, increasing in both COHS counties and in seven (7) Two Plan counties but declining in one. Less change was found for the non-mandatory group. Increased post carve-out outpatient expenditures occurred for the non-mandatory group in five (5) Two Plan counties but in neither COHS county.

Pharmaceuticals   Pre and post carve-out mean monthly expenditures for pharmaceuticals suggest a different trend. Most Two Plan counties and both COHS counties indicated increased monthly expenditures in the post carve-out period. Mean pharmacy and medical supply expenditures were significantly higher in the post carve-out period for all counties but Los Angeles, Riverside, and Santa Clara. Similar increases were found for the non-mandatory group. However, the three Two Plan counties with no mandatory group change showed significant increased pharmaceutical expenditures for the non-mandatory group. The 36 non-expansion county annual means also had indicated greater expenditure changes for the non-mandatory group than for the mandatory group.

Inpatient physician and hospital services Bivariate pre and post carve-out mean monthly expenditures for the mandatory group showed expenditure declines in hospital inpatient services (**Table 6.17B**). Mean monthly expenditures for the mandatory group were lower in the post carve-out months for most expansion counties. No change was found in any COHS county for hospital inpatient services. Kern and Fresno were exceptions among the expansion counties in having

increased post carve-out mean monthly inpatient expenditures. Higher expenditures were found for both mandatory and non-mandatory groups in these two counties. Pre and post carve-out mean monthly expenditures for inpatient physician services suggest a different trend. The COHS and five (5) Two Plan counties indicated higher monthly expenditures in the post carve-out period for inpatient physician services. About half of the Two Plan counties that showed increased physician inpatient expenditures also had indicated increased hospital inpatient expenditures. This divergence could be due to carve-out induced cost-shifting for physician inpatient services where the likelihood of the payment source for the inpatient stay itself did not change. That is, more physician inpatient services were CCS authorized while the authorization "mix" (e.g., CCS versus a Medi-Cal field office) did not change. Finally, mandatory group changes for rehabilitation facility expenditures were mixed. The non-mandatory group showed a more consistent pattern of post carve-out increase.

To summarize the pre-post differences in monthly expenditures by type, in the COHS counties of Santa Cruz and Orange, higher post carve-out monthly expenditures were found for the mandatory group in physician office services, physician inpatient services, pharmacy, and hospital outpatient services. Most Two Plan counties also showed expenditure increases in these service types. Thus the bivariate findings suggest that inpatient expenditure trends may in fact have masked other expenditure changes. This helps to explain why post carve-out expenditure totals that aggregated provider types had generally indicated a (insignificant) decline or no pre-post change.

While these bivariate results do not control for secular trends, they do suggest that pre and post carve-out changes in expenditures may have occurred for selected types of services. In general, the results are consistent with a carve-out effect that increased expenditures on services in ambulatory settings, and for pharmaceuticals, but that did not change expenditures for inpatient services in a consistent pattern. Indication that the carve-out played a role is provided by a comparison of COHS and Two Plan county results. The COHS counties had nearly complete participation in managed care systems and show significant changes over the study period in all ambulatory categories and in pharmacy whereas the partly converted Two Plan counties indicate less consistent results. The fact that mandatory group pre and post carve-out patterns in COHS and Two Plan counties tended to be more consistent with the hypothesized carve-out effects than non-mandatory group patterns also suggests an independent carve-out effect. The following section evaluates carve-out impact in a multivariate framework for the expansion counties and also in comparison to the non-expansion counties.

Table 6.18A – Changes in expenditures by provider type—Two Plan and non-expansion counties, for children in mandatory managed care group (Coefficients and t statistics)

Variable	Physician Services (Office, outpatient, ER, home)		Physician Services (Inpatient)		Pharmaceuticals		Hospital Services (Inpatient)		Hospital Services (Outpatient)	
	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)
Percent MCP (pct2cpli)	0.011 (4.490)	0.004 (1.217)	0.013 (3.278)	0.012 (3.256)	0.003 (1.169)	-0.002 (0.379)	0.001 (0.858)	-0.000 (0.155)	0.013 (3.217)	0.013 (3.562)
Post carve-out (post)	-0.032 (0.390)	-0.394 (2.735)	-0.014 (0.076)	0.057 (0.353)	0.060 (0.352)	-0.034 (0.126)	0.005 (0.079)	0.084 (0.603)	-0.112 (0.539)	-0.215 (1.282)
log Medi-Cal enrolled (ln_s_enr)	3.848 (2.816)	0.445 (0.190)	3.652[a] (4.608)	1.063 (0.737)	0.313 (0.133)	-1.845 (0.604)	1.449 (3.741)	0.393 (0.274)	2.837 (2.220)	1.872 (1.962)
Percent PHP (pct2_php)	0.014 (1.199)	0.015 (1.528)	0.024 (3.105)	0.024 (3.176)	-0.009 (0.744)	-0.028 (1.284)	-0.004 (1.011)	0.001 (0.259)	-0.001 (0.069)	-0.004 (0.357)
1995	-0.285 (3.156)	-0.355 (2.440)	-0.243 (2.531)	-0.399 (3.237)	0.248 (2.293)	0.513 (2.940)	-0.045 (0.783)	-0.217 (1.591)	-0.042 (0.462)	-0.139 (1.289)
1996	-0.021 (0.131)	0.083 (0.476)	-0.258 (1.709)	-0.429 (2.662)	0.536 (2.758)	0.641 (2.999)	-0.036 (0.522)	-0.328 (2.121)	0.122 (0.612)	0.184 (1.647)
1997	0.235 (1.186)	0.728 (3.307)	0.234 (0.641)	-0.123 (0.390)	0.629 (1.954)	0.892 (2.098)	0.042 (0.476)	-0.203 (1.443)	0.430 (1.285)	0.470 (3.494)
R squared	0.76	0.61	0.78	0.63	0.78	0.78	0.93	0.72	0.84	0.73
N	576	1,104	576	1,104	576	1,104	576	1,104	576	1,104

N is total county-months. Each model includes percent PHP participation and 3 season dummy variables (omitted season is Jan-Mar) and the omitted year is 1994. The dependent variable is log of monthly expenditures, or log of total monthly expenditures per claimants.

(1) Model includes the Two Plan counties, with fixed county effects and referent Tulare

(2) Model includes the Two Plan counties and 11 non-expansion counties, with fixed county effects and referent Tulare

[a] Can reject hypothesis that ln_s_enr=1, p<0.05

Regressions report White-corrected standard errors with assumption of independence within groups (county) relaxed.

Table 6.18B – Changes in expenditures by provider type—Two Plan and non-expansion counties, for children in non-mandatory managed care group (Coefficients and t statistics)

Variable	Provider Category									
	Physician Services (Office, outpatient, ER, home)		Physician Services (Inpatient)		Pharmaceuticals		Hospital Services (Inpatient)		Hospital Services (Outpatient)	
	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)
Percent MCP (pct2cpli)	0.122 (3.960)	-0.094 (3.271)	0.097 (2.347)	0.134 (3.033)	-0.023 (2.397)	-0.036 (2.297)	0.035 (2.097)	0.018 (0.949)	0.102 (4.220)	0.074 (4.062)
Post carve-out (post)	-0.116 (1.059)	-0.225 (1.494)	-0.245 (1.379)	-0.268 (1.480)	0.004 (0.061)	-0.006 (0.056)	-0.104 (1.063)	-0.243 (2.940)	-0.171 (1.906)	-0.200 (1.610)
log Medi-Cal enrolled (ln_s_enr)	6.885 (5.889)	5.197 (2.331)	2.969 (1.535)	3.012 (1.027)	-2.524 (1.691)	-0.244 (0.103)	1.878 (1.853)	1.575 (1.173)	2.874 (3.163)	0.602 (0.453)
Percent PHP (pct2_php)	0.129 (3.842)	0.206 (3.631)	0.119 (2.545)	0.273 (1.982)	-0.009 (0.415)	-0.048 (2.042)	0.037 (1.424)	0.011 (0.482)	0.106 (3.546)	0.118 (2.772)
1995	-0.352 (3.986)	-0.358 (2.875)	-0.192 (1.894)	-0.186 (1.016)	0.213 (1.985)	0.293 (1.748)	-0.079 (1.656)	0.010 (0.083)	-0.146 (2.195)	-0.108 (1.151)
1996	-0.452 (3.377)	-0.463 (2.379)	-0.278 (1.218)	-0.281 (0.885)	0.577 (3.245)	0.516 (2.634)	-0.074 (0.564)	0.130 (1.005)	-0.163 (1.568)	-0.162 (0.987)
1997	-0.369 (2.750)	0.096 (0.501)	-0.118 (0.356)	0.126 (0.330)	0.896 (5.304)	0.863 (4.376)	-0.078 (0.484)	0.221 (1.274)	-0.154 (0.827)	0.206 (1.387)
R squared	0.79	0.67	0.80	0.64	0.84	0.78	0.93	0.76	0.88	0.80
N	576	1,104	576	1,104	576	1,104	576	1,104	576	1,104

N is total county-months. Each model includes percent PHP participation and 3 season dummy variables (omitted season is Jan-Mar) and the omitted year is 1994. The dependent variable is log of monthly expenditures, or log of total monthly expenditures per claimants.
(1) Model includes the Two Plan counties, with fixed county effects and referent Tulare
(2) Model includes the Two Plan counties and 11 non-expansion counties, with fixed county effects and referent Tulare
[a] Can reject hypothesis that ln_s_enr=1, p<0.05
Regressions report White-corrected standard errors with assumption of independence within groups (county) relaxed.

Multivariate Analysis of Changes to *Expenditures (Total and Per Monthly Claimants)*
by Provider Type

This section provides multivariate results for two effect measures. The first is total expenditures per provider type. The second is expenditures by provider type per total monthly claimants. Because Two Plan and COHS county criteria for mandatory managed care participation differ, results are first presented for the Two Plan counties and then for the COHS counties. Results from multivariate specifications that combined the Two Plan expansion and non-expansion counties are provided as Model 2 in **Table 6.18A** and **Table 6.18B**. All COHS results presented include the eleven non-expansion comparison counties.

Two Plan Counties

Multivariate analysis accounts for the secular changes that could affect average expenditures by provider type. This is particular important given the possible changes in treatment practice, in the inpatient versus outpatient service mix, and in CCS coverage of specific services. An example is the expanded role of CCS in authorizing pharmaceutical claims that evolved over the study period. As in earlier models, year dummies in the specifications are included because of (1) program complexity and incomplete knowledge about all significant changes over the study period (e.g., in authorization practices and patterns of care not caused by the carve-out), and (2) incomplete knowledge of the timing of their impact, if any. For example, the timing of exogenous (non carve-out related) authorization changes taking effect is difficult to establish. Even if the effective dates are known, the authorization effect could be delayed or it could be immediate. An important consideration for inference is that these time trend variables in combination with the county fixed effects are likely to explain much of the variation in the outcome variables. Given the short follow-up period for which claims were available, and the inclusion of the county and year effect variables, there are limitations to what can be explained with the policy impact measures.

Multivariate results for total expenditures by provider type in the expansion counties are presented first. The combined expansion and non-expansion county results discuss the measure of total expenditures as well as the measure of expenditures per total claimants.

Results for several different specifications are provided in **Table 6.18A, Changes in expenditures by provider type—Two Plan and non-expansion counties, for children in mandatory managed care group**. The same specifications are provided for physician inpatient services and other major provider types (pharmacy, rehabilitation hospital, inpatient hospital, outpatient hospital). Findings for the non-mandatory group are provided in **Table 6.18B**. Results for Two Plan counties, and for Two Plan counties combined with the eleven non-expansion counties, were evaluated.

Ambulatory physician and outpatient hospital services As illustrated in **Table 6.18A**, monthly expenditures on ambulatory physician services were higher post carve-out for the mandatory group in Two Plan counties (Model 1). Expenditures also increased with post carve-out MCP participation for the non-mandatory group (Model 1, **Table 6.18B**). This may support the inference that the

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carve-out combined with the managed care expansion stimulated greater referral to CCS for all beneficiaries, rather than only those subjected to the mandatory managed care requirement. For purposes of inference, it is important to consider that most non-mandatory beneficiaries did not participate in the health plans. More mandatory group eligibles than non-mandatory eligibles would be exposed to any identification and referral practices conducted by health plans. Thus most potential CCS claimants within the non-mandatory group thus would only be affected by provider practice changes and by any Medi-Cal field office or CCS practice changes in authorization practices. Differences across counties in carve-out impact may have occurred particularly for ambulatory services of physicians and hospital outpatient facilities. With respect to provider type specifically, certain counties may use physician office or outpatient settings more than other counties as a site of care for children with CCS diagnoses, and this could affect both the baseline and the relative carve-out impact for particular types of services.

Outpatient hospital expenditures increased for both groups, and the coefficients changed little when the non-expansion counties were included. The question of whether ambulatory service expenditures per claimants changed within the expansion counties was evaluated. Increased MCP participation was associated with increased ambulatory physician and outpatient hospital expenditures per total monthly claimants.

How did inferences change when Two Plan counties were compared with non-expansion counties? The results for total expenditures are provided as Model 2 in **6.18A** and **6.18B**. Results suggest that for the ambulatory physician service category, increased expenditures were generally common to both the Two Plan counties and the eleven non-expansion counties. The significant association between MCP participation rates and monthly expenditures for the Two Plan counties did not show the same association for the mandatory group when non-expansion counties were included. For the mandatory group, the coefficient fell from 0.011 to 0.004 and was no longer significant (p=0.24). Year dummies indicated a much more substantial increase in expenditures for 1997 relative to the baseline year, in the combined model (coefficient of 0.728) than in the Two Plan model (coefficient of 0.235). For the non-mandatory group, the increase in total physician ambulatory services found for the Two Plan counties was sustained when non-expansion counties were included. The coefficient for managed care participation fell slightly from 0.122 to 0.094 but was still significant. These findings were reflected in the results for expenditures per total monthly claimants (**Table 6.19A** and **Table 6.19B**). Increased expenditures on ambulatory physician services per claimants were not associated with increased MCP participation in the mandatory group, but the association held for the non-mandatory group. Finally, hospital outpatient expenditures increased per claimant in specifications with and without the comparison counties.

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Table 6.19 – Changes in total expenditures and expenditures per claimants, by type of provider—Pooled COHS and non-expansion counties, for children in mandatory managed care group (Coefficients and absolute t statistics)

Variable	Physician Services (Office, ER, Outpatient, Home)		Physician Services (Inpatient)		Pharmacy and Medical Supplies		Hospital Services (Inpatient)		Hospital Services (Outpatient)		Rehabilitation Services		Other Services[b]	
	Total paid	Paid/clmts	Total paid	Paid/clmts	Total paid	Paid/clmts	Total paid	Paid/clmts	Total paid	Paid/clmts	Total paid	Paid/clmts	Total paid	Paid/clmts
Percent MCP (pct2cohs)	0.006 (2.536)	0.003 (1.728)	0.006 (1.420)	0.001 (0.224)	0.014 (2.955)	0.010 (2.340)	-0.001 (0.750)	-0.004 (3.933)	0.005 (2.643)	0.002 (0.865)	-0.001 (0.073)	-0.006 (1.387)	0.016 (5.132)	0.012 (4.232)
Post indicator (post)	0.101 (1.028)	0.124 (1.471)	0.790 (3.245)	0.771 (4.144)	-0.404 (1.891)	-0.356 (1.738)	-0.114 (1.509)	-0.128 (1.517)	-0.028 (0.207)	-0.026 (0.235)	-0.227 (0.555)	-0.076 (0.387)	-0.243 (1.084)	-0.261 (1.377)
log Medi-Cal enrolled (ln_s_enr)	0.773 (0.359)	-0.631 (0.518)	0.033 (0.020)	-0.640 (0.394)	1.964 (1.222)	-0.942 [a] (0.709)	-1.07 (0.934)	0.341 (0.279)	-0.576 (0.306)	-1.018 (0.674)	1.026 (0.170)	1.249 (0.687)	-1.178 (1.017)	-0.143 (0.113)
Percent PHP (pct2_php)	0.025 (2.410)	0.022 (2.484)	0.037 (1.158)	0.020 (0.861)	0.013 (0.657)	-0.012 (0.593)	-0.010 (2.277)	-0.010 (2.788)	-0.013 (0.776)	-0.016 (0.935)	-0.006 (0.333)	-0.032 (3.370)	0.041 (2.963)	0.040 (2.895)
1995	-0.249 (2.025)	-0.409 (3.834)	-0.264 (1.972)	-0.389 (3.662)	0.487 (2.999)	0.336 (2.277)	0.070 (0.752)	-0.210 (2.181)	-0.091 (0.791)	-0.234 (2.239)	1.323 (4.005)	0.869 (5.152)	0.081 (0.783)	-0.039 (0.372)
1996	0.050 (0.278)	-0.151 (1.087)	-0.333 (1.729)	-0.481 (3.819)	0.402 (2.161)	0.170 (1.075)	-0.162 (1.320)	-0.411 (3.541)	0.016 (0.098)	-0.232 (1.486)	1.612 (2.805)	0.929 (2.974)	0.442 (6.504)	0.222 (3.208)
1997	0.556 (4.406)	0.123 (1.652)	-0.199 (0.826)	-0.503 (2.763)	0.944 (5.807)	0.495 (3.530)	0.056 (0.383)	-0.474 (3.135)	0.314 (2.408)	-0.095 (0.789)	1.706 (2.841)	0.880 (2.974)	0.538 (6.189)	0.159 (1.748)
R squared	0.61	0.41	0.54	0.20	0.65	0.37	0.76	0.34	0.69	0.37	0.66	0.64	0.74	0.38

Provider Category

N is total county-months. Model includes the COHS expansion counties and 11 non-expansion counties, N=624 (13 counties) with fixed county effects and referent Santa Cruz. Each model includes 3 season dummy variables (omitted season is Jan-Mar) and the omitted year is 1994. The dependent variable is log of monthly expenditures, or log of total monthly expenditures per claimants. Regressions report White-corrected standard errors with assumption of independence within groups (county) relaxed.

[a] Can reject hypothesis that ln_s_enr=1, p<0.05
[b] Includes all other services with the exception of any non-categorized services identified as physician services

Table 6.20A – Changes in total expenditures per monthly claimants, by provider type—Two Plan and non-expansion counties, for children in mandatory managed care groups (Coefficients and t statistics)

Variable	Physician Services (Office, outpatient, ER, home)		Physician Services (Inpatient)		Pharmaceuticals		Hospital Services (Inpatient)		Hospital Services (Outpatient)	
	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)
Percent MCP (pct2cpli)	0.004 (2.371)	0.001 (0.401)	0.007 (2.133)	0.007 (2.555)	-0.003 (1.524)	-0.006 (1.952)	-0.005 (8.889)	-0.005 (4.024)	0.007 (2.540)	0.008 (2.894)
Post carve-out (post)	0.042 (0.490)	-0.165 (1.959)	0.061 (0.364)	0.193 (1.519)	0.134 (0.886)	0.152 (0.728)	0.079 (0.978)	0.232 (2.208)	-0.003 (0.018)	-0.026 (0.200)
log Medi-Cal enrolled (ln_s_enr)	1.904 (1.411)	0.135 (0.100)	1.723 (3.012)	-0.033 (0.034)	-1.620 (0.745)	-2.869 (1.461)	-0.484 (1.582)	-0.745 (0.681)	0.843 (0.755)	0.617 (0.735)
Percent PHP (pct2_php)	0.015 (1.947)	0.014 (2.426)	0.026 (3.032)	0.024 (3.214)	-0.008 (0.720)	-0.020 (1.218)	-0.003 (0.616)	0.003 (0.554)	0.001 (0.099)	-0.001 (0.156)
1995	-0.399 (3.734)	-0.399 (3.169)	-0.361 (4.483)	-0.437 (4.242)	-0.132 (1.318)	0.352 (2.710)	-0.161 (2.897)	-0.275 (2.522)	-0.190 (1.853)	-0.226 (2.557)
1996	-0.117 (0.702)	-0.039 (0.328)	-0.356 (2.626)	-0.514 (4.670)	0.440 (2.635)	0.453 (2.735)	-0.132 (1.927)	-0.430 (3.093)	-0.024 (0.149)	0.004 (0.036)
1997	0.006 (0.028)	0.315 (2.146)	0.003 (0.011)	-0.396 (1.706)	0.401 (1.477)	0.483 (1.603)	-0.269 (3.826)	-0.505 (3.483)	0.112 (0.521)	0.096 (0.900)
R squared	0.18	0.26	0.54	0.32	0.40	0.45	0.46	0.28	0.57	0.43
N	576	1,104	576	1,104	576	1,104	576	1,104	576	1,104

N is total county-months. Each model includes 3 season dummy variables (omitted season is Jan-Mar) and the omitted year is 1994. The dependent variable is log of monthly expenditures per total claimants.
(1) Model includes the Two Plan counties, with fixed county effects and referent Tulare
(2) Model includes the Two Plan counties and 11 non-expansion counties, with fixed county effects and referent Tulare
[a] Can reject hypothesis that ln_s_enr=1, p<0.05
Regressions report White-corrected standard errors with assumption of independence within groups (county) relaxed.

Table 6.20B – Changes in total expenditures per monthly claimants, by provider type—Two Plan and non-expansion counties, for children in non-mandatory managed care groups (Coefficients and t statistics)

Variable	Provider Category									
	Physician Services (Office, outpatient, ER, home)		Physician Services (Inpatient)		Pharmaceuticals		Hospital Services (Inpatient)		Hospital Services (Outpatient)	
	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)
Percent MCP (pct2cpli)	0.096 (3.330)	0.084 (3.295)	0.071 (1.837)	0.091 (3.031)	-0.050 (5.093)	-0.053 (3.708)	0.008 (0.477)	-0.000 (0.034)	0.076 (3.424)	0.057 (3.612)
Post carve-out (post)	-0.084 (0.771)	-0.140 (1.213)	-0.207 (1.228)	-0.173 (1.131)	0.036 (0.452)	0.090 (0.822)	-0.072 (0.764)	-0.148 (1.906)	-0.139 (1.457)	-0.144 (1.450)
log Medi-Cal enrolled (ln_s_enr)	5.320 (4.104)	2.821 (1.810)	1.470 (0.824)	1.902 (0.936)	-4.090 (2.674)	-1.945 (0.772)	0.312 (0.336)	-0.181 (0.231)	1.309 (1.402)	-0.704 (0.539)
Percent PHP (pct2_php)	0.083 (2.772)	0.142 (3.257)	0.075 (1.850)	0.160 (2.254)	-0.055 (2.556)	-0.070 (3.173)	-0.008 (0.356)	-0.018 (0.945)	0.060 (2.430)	0.080 (2.754)
1995	-0.433 (4.708)	-0.445 (4.541)	-0.281 (2.731)	-0.322 (2.391)	0.132 (1.284)	0.205 (1.353)	-0.160 (3.158)	-0.101 (0.993)	-0.228 (3.178)	-0.235 (3.315)
1996	-0.531 (3.806)	-0.467 (3.053)	-0.370 (1.642)	-0.481 (1.924)	0.497 (2.638)	0.373 (1.975)	-0.154 (1.128)	-0.020 (0.174)	-0.243 (2.459)	-0.271 (2.218)
1997	-0.560 (4.406)	-0.247 (1.745)	-0.325 (1.054)	-0.424 (1.542)	0.705 (3.699)	0.564 (3.004)	-0.269 (1.807)	-0.086 (0.637)	-0.345 (2.125)	-0.100 (0.833)
R squared	0.28	0.40	0.42	0.28	0.52	0.40	0.41	0.24	0.54	0.42
N	576	1,104	576	1,104	576	1,104	576	1,104	576	1,104

N is total county-months. Each model includes 3 season dummy variables (omitted season is Jan-Mar) and the omitted year is 1994. The dependent variable is log of monthly expenditures per total claimants.
(1) Model includes the Two Plan counties, with fixed county effects and referent Tulare
(2) Model includes the Two Plan counties and 11 non-expansion counties, with fixed county effects and referent Tulare
[a] Can reject hypothesis that ln_s_enr=1, p<0.05
Regressions report White-corrected standard errors with assumption of independence within groups (county) relaxed.

It should be noted that the expansion and the eleven non-expansion counties did not have statistically different trends in claimant volume or in total expenditures in the pre carve-out years of 1994 and 1995. This fact was used to justify use of a set of non-expansion counties as a comparison group. However, it required an assumption that the absence of different time trend in the 1994 and 1995 would have extended to the post carve-out years had the carve-out not been implemented. It is important to keep this assumption in mind in interpreting the results of these models, and it is the reason that expansion county results are presented in addition to the combined county results.

Pharmaceuticals A post carve-out increase was found for the mandatory group in the comparison of means. Expenditures did not appear to increase with MCP participation in multivariate analysis of expansion counties, for the mandatory group (**Table 6.18A**) or for the non-mandatory group (**Table 6.18B**). Instead, the pre-post increase appeared to be explained by time trend variables, which indicated no change in 1995 relative to 1994 but increases in 1996 and 1997 relative to the baseline year for both groups. Thus a time trend and not MCP participation rates in the group explained the increased expenditures on pharmaceuticals for the non-mandatory group. In fact, expenditures declined with increasing MCP participation in the non-mandatory group. Given these expenditure patterns, and earlier findings of claimant volume increases, it is not surprising that per claimant expenditures were associated with MCP participation and tended to decline for both mandatory and non-mandatory groups (although the coefficient in the mandatory group was not significant). Inclusion of the non-expansion counties did not change these conclusions about pharmaceutical expenditures (Model 2).

Inpatient physician and inpatient hospital services Physician inpatient expenditures increased with higher rates of managed care participation for the mandatory and non-mandatory groups. Moreover, expenditures per total monthly claimants also increased. These findings held when non-expansion counties were combined with the Two Plan counties. In contrast, hospital inpatient expenditures did not change for the mandatory group and per claimant expenditures declined with increased MCP participation for the mandatory group (**Table 6.18A**). Hospital inpatient expenditures appeared to increase with MCP participation for the non-mandatory group, although the coefficient fell from 0.035 to 0.018 and was no longer significant when the expansion and non-expansion counties were combined.

Expansion COHS Counties

Results from multivariate specifications for the COHS expansion counties are provided in **Table 6.19, Changes in total expenditures and expenditures per claimants, by type of provider—Combined COHS and non-expansion counties, for children in mandatory managed care group**. It is important to note that the mandatory group in the COHS counties includes a larger proportion (nearly all) of Medi-Cal eligibility aid categories than the mandatory group in the Two Plan counties. Due to the relatively small size of the non-mandatory group in the COHS counties, the mandatory group was the focus of the multivariate analyses.

For physician ambulatory services, the coefficient for MCP participation indicated a carve-out effect on expenditures and approached significance for expenditures per total claimants. This is somewhat in contrast with the Two Plan counties where expenditures were not associated with MCP participation when the non-expansion counties were included. It is not necessarily surprising given that the mandatory group in the COHS counties includes beneficiaries from aid categories with mandatory and non-mandatory status in Two Plan counties, but it does raise a question about the mechanism for carve-out impact. The explanation may stem from the nature of pre carve-out CCS "circumvention". If this occurred at a higher rate for beneficiaries in the (Two Plan county) non-mandatory aid categories, then MCP participation would be expected to be associated with non-mandatory group increases in the Two Plan counties and mandatory group increases in the COHS counties, as found. The pattern found for ambulatory physician services was also found for hospital outpatient services. The exception was that with the claimant volume increases, the increased hospital outpatient services were not substantial enough to produce an increase in expenditures per total monthly claimants.

Managed care participation rates were associated with increased pharmaceutical expenditures in the COHS counties, and expenditures per total claimants also increased. A significant time trend of increased pharmaceutical expenditures was found in these specifications as well, as found for the Two Plan counties. Coefficients for these time dummies appeared to be of similar magnitude in the Two Plan and the COHS county specifications that included non-expansion counties.

Unlike the Two Plan counties, the positive coefficient for the rate of managed care participation for inpatient physician services was not statistically significant in the combined county specification (**Table 6.19**). Expenditures per monthly claimants did not change with increased MCP participation (p=0.22) as it had for the Two Plan counties. However, a specification using a post carve-out indicator did show a sizable increase in this measure in the combined COHS and non-expansion county specification, with a coefficient of 0.827 (indicating a 129 percent increase at p=0.01). Year dummies in this specification were generally negative and statistically significant. As noted earlier, use of the post indicator in the COHS county models is problematic due to difficulty in identification.

As with the combined expansion and non-expansion specifications for the Two Plan counties, rates of MCP participation were not associated with total hospital inpatient expenditures, and expenditures per total claimants declined. A similar result was found for rehabilitation service expenditures for the COHS counties, although year dummies indicated an independent, increasing time trend.

In summary, these findings indicate that increases in ambulatory service expenditures (physician and hospital outpatient) and pharmacy were associated with the rate of MCP participation in the COHS counties, even in models that included non-expansion counties.[80]

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[80] It is important to consider how MCP participation rate increases in COHS counties compare to rates in Two Plan counties. MCP participation increased from zero to nearly 100 percent participation in a span of several months for Orange County with full participation achieved almost immediately in Santa Cruz County. In contrast, none of the Two Plan counties had monthly MCP participation rates (among

A comparison of results for the Two Plan and the COHS counties tended to show a common carve-out effect for the mandatory managed care group. When combined with the non-expansion counties, physician ambulatory services expenditures increased significantly for the COHS counties and were positive but not significant for the Two Plan counties. The opposite pattern was found for physician inpatient services, which were associated with MCP participation rates in the Two Plan but not in the COHS counties, although the coefficient in the COHS county specification was positive (t statistic of 1.42). Both groups of expansion counties had positive coefficients for hospital outpatient services and negative, non-significant coefficients for hospital inpatient services. The only differences between the county groups with respect to expenditures per claimants by provider type were found in pharmaceuticals (increasing with rate of MCP participation in COHS counties, no change in the Two Plan county mandatory group) and in outpatient hospital services (no change with MCP participation rates in COHS counties, increasing in Two Plan counties).

Finally, a positive association was expected between monthly Medi-Cal enrollment and the outcome of total expenditures. The expected association between enrollment and total expenditures *per claimant* is ambiguous. It is possible that lower Medi-Cal enrollment may result in a lower intensity case-mix, which serves as the base population for CCS claimants. If this occurs, then there may be a small and negative association between Medi-Cal enrollment and expenditures per total claimants. Including this variable in the multivariate specifications helps to control for any compositional changes within the base population of Medi-Cal beneficiaries, as well as changes to the size of the base population. The coefficient for Medi-Cal enrollment was rarely statistically different from one in the expenditure models, and generally did not differ from zero in the expenditures per total claimants models (with the exception of physician ambulatory services in the non-mandatory Two Plan group where it was positive and significant). As in earlier analyses, PHP participation could reduce the pool of monthly CCS claimants and also increase the average "case-mix" intensity of the monthly CCS claimant population. PHP participation was included in specifications but did not have consistent signs.

Summary of Findings for Expenditures and Per Claimant Expenditures by Type

To summarize, expenditures for ambulatory physician and hospital outpatient services increased as a function of MCP participation as expected, although the effect was not statistically significant in the Two Plan mandatory group when compared with the eleven non-expansion counties. The fact that pharmaceuticals did not increase with MCP participation rates for the mandatory or non-mandatory groups in the Two Plan counties—although the year effects showed large and significant increases—and did increase with MCP participation in COHS counties—indicates either different responses within these settings, a different pre carve-out situation with respect to CCS circumvention, or a problem with the COHS county specification of the carve-out effect. The results also confirm that expenditures per total monthly claimants for physician inpatient services declined or

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mandatory eligibles) exceeding 90 percent during the study period, and most did not reach peak participation rates for at least six post carve-out months. These rates were illustrated in Chapter 4.

did not change. Finally, there were significant time trends common to expansion and non-expansion counties.

These findings raise several questions. Did the number of claimants receiving particular types of services increase as MCP participation increased? Were changes to expenditures per recipient consistent across Two Plan and COHS counties? These questions are addressed in the following sections.

6.5.3   CCS Claimant Volume by Type of Provider

Even though the carve-out did not increase expenditures as expected for ambulatory services, it is possible that more children received such services within a given month. Because total claimant volume and caseload characteristics are important study outcomes, the characteristics of those receiving services of different provider types was examined. This analysis was conducted for insight into whether the total monthly CCS claimants with expenditures in a given provider type increased. For some types of services, claimant volume may not change and instead expenditures per claimants receiving those services ("recipients") may increase. Alternatively, increased volume of claimants due to case-finding incentives could cause mean per recipient expenditures to decline. Three measures were evaluated. The first measure was the volume of individuals with one or more claims for a given provider type. The second measure was those having a claim for a given provider type, as a proportion of all monthly claimants. The third measure was total expenditures by provider type, among those having one or more such claims in the month ("recipients").

The following section presents pre and post carve-out trends for the measures of total recipients of a given provider type, and total recipients as a proportion of total monthly claimants. Multivariate results for the three claimant volume measures of total recipients, total expenditures per recipient, and recipients of each type of service as a proportion of total monthly claimants are then presented.

Pre and Post Carve-Out Claimant Volume by Provider Type in Two Plan and COHS Expansion Counties

Pre and post carve-out trends for total recipients of a given provider type are followed by pre-post trends for total recipients as a proportion of total monthly claimants.

Claimants With Provider Type Claim

Bivariate pre and post comparisons indicated that there were different patterns of claimant activity across provider types in the expansion counties. Results are provided in **Table 6.21A, Pre and post carve-out mean monthly claimants by provider type (physician office, physician inpatient, pharmacy)—Two Plan and COHS expansion counties, by mandatory managed care group**, and in **Table 6.21B, Pre and post carve-out mean monthly claimants by provider type (hospital inpatient, hospital outpatient, rehabilitation facility)—Two Plan and COHS expansion counties, by mandatory managed care group**. For physician ambulatory services, both COHS

counties and eight (8) of eleven (11) implementing Two Plan counties showed higher post carve-out claimant volume. Two (2) of the other three (3) counties that did not have increased volume were also found to have lower monthly expenditures. The magnitude of the pre-post difference varied by county. For example, in the mandatory group, mean monthly claimants with an ambulatory physician claim increased from 25 to 115 monthly (14 Post months) in Fresno and from 14 to 22 monthly (11 Post months) in Stanislaus. Nearly all expansion counties showed higher volume of claimants with CCS-authorized hospital outpatient services in the post carve-out period. This included all Two Plan and COHS county mandatory groups, eleven (11) of the twelve (12) non-mandatory groups, and one (1) of the two (2) COHS non-mandatory groups.

The monthly volume of claimants for pharmaceuticals increased for the mandatory group in all counties but Alameda and Riverside, and for the non-mandatory group in all expansion counties with the exception of Alameda and Santa Cruz.

As might be expected, the monthly volume of claimants with hospital inpatient claims increased in few counties. In three (3) of the four (4) counties where an increase was found (Alameda, Fresno, Kern, Orange), both mandatory and non-mandatory groups showed an increase. The changes were of relatively small magnitude in Alameda (8.8 percent difference between the pre and post carve-out means for the non-mandatory group) and in Orange (approximately 10 percent differences in both groups) but large in Fresno (41.7 percent for the mandatory group and 43.6 percent for the non-mandatory group) and in Kern (39.6 percent and 35.3 percent, respectively). The largest declines were in San Francisco at 19.2 percent for the non-mandatory group, and in San Francisco at 22.2 percent and Santa Clara at 19.2 percent for the mandatory group. For rehabilitation hospital services, as with monthly expenditures, claimant volume increased in about half of the expansion counties. Most of the other expansion counties showed no change. Declines for the mandatory or non-mandatory group occurred in just two counties (Contra Costa and Santa Clara).

Table 6.21A – Pre and Post carve-out mean monthly claimants by provider type (Physician office, Physician inpatient, Pharmacy):Two Plan and COHS expansion counties, by mandatory managed care group

Expansion County	N Pre	N Post	Physician Services (Office, ER, Outpatient, Home) Non-Mandatory Pre	Non-Mandatory Post	Mandatory Pre	Mandatory Post	Physician Services (Inpatient) Non-Mandatory Pre	Non-Mandatory Post	Mandatory Pre	Mandatory Post	Pharmacy and Medical Supplies Non-Mandatory Pre	Non-Mandatory Post	Mandatory Pre	Mandatory Post
2 Plan counties[a]														
Alameda	24	24	62.6 (2.6)	101.6 (7.1) **	50.2 (2.3)	95.2 (6.4) **	28.3 (1.1)	38.8 (1.8) **	42.4 (2.1)	51.0 (2.9) **	82.9 (1.4)	106.7 (1.9) **	27.2 (0.9)	27.5 (0.7) **
Contra Costa	37	11	29.8 (1.2)	59.9 (3.2) **	16.4 (1.0)	45.4 (2.8) **	13.8 (0.6)	17.0 (1.0) **	14.2 (0.7)	21.8 (1.4) **	41.0 (0.9)	45.8 (1.4) **	9.8 (0.5)	12.4 (0.6) **
Fresno	34	14	35.6 (1.9)	68.6 (8.3) **	25.4 (1.8)	114.7 (17) **	14.4 (0.7)	28.0 (3.3) **	9.3 (0.6)	45.8 (5.5) **	113.4 (3.8)	151.4 (7.5) **	21.9 (1.0)	26.4 (1.5) **
Kern	30	18	28.9 (1.1)	50.7 (3.5) **	22.8 (1.0)	59.4 (6.0) **	10.8 (0.7)	29.7 (3.2) **	10.9 (0.6)	47.8 (4.1) **	59.4 (1.8)	83.3 (3.1) **	17.5 (1.0)	28.6 (1.0) **
Los Angeles	39	9	1,204.1 (26.4)	1,095.6 (142.8) **	806.4 (25.0)	507.9 (82.6) **	332.0 (5.0)	367.1 (11.9) **	248.8 (6.0)	202.9 (11.0) **	581.3 (27.0)	834.1 (11.0) **	165.0 (5.0)	198.2 (11.2) **
Riverside	32	16	53.0 (2.2)	86.0 (4.4) **	33.7 (1.9)	45.1 (3.1) **	24.3 (1.1)	36.7 (2.3) **	17.6 (0.8)	30.8 (2.4) **	114.2 (5.1)	165.4 (3.8) **	35.6 (1.0)	35.1 (0.9) **
San Bernardino	32	16	91.7 (2.0)	139.9 (7.4) **	68.1 (2.4)	82 (4.6) **	36.2 (1.2)	62.4 (4.8) **	32.6 (1.2)	48.6 (3.3) **	183.5 (5.1)	231.8 (2.7) **	57.9 (1.2)	63.7 (1.5) **
San Francisco	30	18	28.5 (1.1)	25.5 (1.2) **	21.2 (1.9)	14.9 (1.0) **	18.1 (1.0)	12.3 (1.0) **	14.0 (0.9)	13.0 (1.0) **	43.0 (2.2)	58.3 (1.1) **	5.6 (0.5)	13.1 (0.8) **
San Joaquin	25	23	26.7 (1.0)	47.4 (4.5) **	27.8 (2.6)	43.8 (2.5) **	17.6 (1.0)	18.2 (1.0) **	15.3 (0.9)	26.6 (1.8) **	53.9 (1.2)	78.3 (2.7) **	9.1 (0.9)	16.6 (0.8) **
Santa Clara	33	15	91.9 (2.0)	57.1 (6.4) **	69.8 (2.6)	54.5 (4.4) **	25.2 (0.7)	15.1 (1.3) **	19.8 (0.8)	15.5 (1.5) **	80.1 (2.6)	113.3 (1.9) **	19.3 (0.8)	28.3 (1.3) **
Stanislaus	37	11	21.3 (0.8)	35.6 (3.3) **	14.4 (0.8)	22.2 (2.0) **	9.9 (0.6)	9.0 (0.6) **	8.1 (0.6)	12.5 (1.9) **	56.1 (1.2)	64.9 (1.7) **	11.5 (0.4)	15.6 (1.2) **
Tulare	48	0	27.9 (0.9)	—	22.4 (0.8)	—	6.1 (0.4)	—	7.0 (0.5)	—	68.9 (1.5)	—	16.8 (0.5)	—
COHS counties[b]														
Orange	21	27	51.9 (4.3)	57.7 (3.2) **	216.8 (10.4)	520.1 (25.7) **	19.5 (1.1)	28.4 (2.2) **	71.4 (3.6)	167.4 (7.4) **	14.5 (1.0)	19.3 (1.1) **	110.1 (3.2)	185.0 (9.2) **
Santa Cruz	24	24	5.6 (0.5)	8.2 (0.6) **	39.2 (1.8)	103.4 (3.1) **	3.0 (0.4)	2.6 (0.4) **	11.2 (0.8)	20.5 (1.2) **	2.0 (0.2)	2.2 (0.2) **	22.0 (1.2)	40.9 (1.7) **

Total months in the observed Pre and Post periods correspond to carve-out dates for each county

[a] Mandatory and non-mandatory groups defined according to Two Plan expansion criteria

[b] Mandatory and non-mandatory groups defined according to COHS expansion criteria

* Test of equality of means (Pre vs. Post), $p<0.10$

** Test of equality of means (Pre vs. Post), $p<0.05$

Table 6.21B – Pre and Post carve-out mean monthly claimants by provider type (Hospital inpatient, Hospital outpatient, Rehabilitation facility): Two Plan and COHS expansion counties, by mandatory managed care group

Expansion County	Months in Period N Pre	Months in Period N Post	Hospital—Outpatient Non-Mandatory Pre	Hospital—Outpatient Non-Mandatory Post	Hospital—Outpatient Mandatory Pre	Hospital—Outpatient Mandatory Post	Hospital—Inpatient Non-Mandatory Pre	Hospital—Inpatient Non-Mandatory Post	Hospital—Inpatient Mandatory Pre	Hospital—Inpatient Mandatory Post	Rehabilitation Facility Non-Mandatory Pre	Rehabilitation Facility Non-Mandatory Post	Rehabilitation Facility Mandatory Pre	Rehabilitation Facility Mandatory Post
2 Plan counties[a]														
Alameda	24	24	27.2 (1.2)	60.3 ** (3.8)	17.6 (0.9)	71.2 ** (5.8)	61.4 (1.5)	66.8 ** (1.9)	76.7 (1.6)	72.1 (2.2)	112.0 (7.6)	155.9 ** (4.2)	38.7 (2.3)	36.1 (1.2)
Contra Costa	37	11	18.0 (0.8)	28.6 ** (2.0)	6.5 (0.4)	33.3 ** (3.5)	26.1 (0.8)	26.2 (1.3)	26.8 (1.1)	29.4 (1.6)	48.8 (4.5)	22.1 ** (4.7)	11.2 (1.0)	7.8 (1.3)
Fresno	34	14	29.6 (0.7)	56.2 ** (8.0)	6.3 (0.4)	91.1 ** (14.1)	48.6 (1.6)	79.8 ** (3.6)	48.9 (1.4)	69.3 ** (2.7)	109.1 (7.3)	164.6 ** (4.6)	25.8 (1.1)	33.0 ** (1.3)
Kern	30	18	24.2 (1.1)	49.7 ** (2.4)	16.1 (0.7)	60.8 ** (4.8)	36.3 (1.0)	49.1 ** (2.2)	44.9 (1.7)	62.7 ** (2.3)	3.7 (0.4)	4.9 ** (0.4)	2.6 (0.3)	2.3 (0.4)
Los Angeles	39	9	1,080.5 (27.4)	1,426.2 ** (40.8)	660.0 (14.6)	722.8 ** (17.5)	680.8 (4.5)	681.2 (10.1)	608.1 (10.0)	531.1 ** (14.9)	976.7 (54.3)	1,117.6 ** (103.9)	193.6 (6.7)	229.4 ** (11.4)
Riverside	32	16	91.1 (4.2)	137.6 ** (3.6)	44.3 (1.7)	58.8 ** (3.5)	74.1 (2.3)	77.6 (1.9)	68.5 (1.4)	62.5 ** (1.5)	88.8 (9.8)	69.6 (14.2)	9.6 (1.0)	9.8 (0.8)
San Bernardino	32	16	160.3 (4.6)	221.1 ** (6.2)	85.9 (2.3)	104.3 ** (5.7)	117.0 (1.9)	123.1 (3.8)	115.6 (2.4)	100.6 ** (3.0)	121.6 (19.8)	292.8 ** (18.1)	19.0 (1.3)	24.9 ** (1.3)
San Francisco	30	18	75.5 (1.7)	99.2 ** (3.9)	30.4 (1.0)	41.6 ** (2.8)	32.4 (1.1)	32.0 (1.1)	29.6 (1.8)	23.0 ** (1.0)	14.7 (1.0)	62.8 ** (5.6)	3.8 (0.4)	15.6 ** (1.4)
San Joaquin	25	23	45.0 (2.0)	66.1 ** (2.8)	18.9 (1.5)	36.2 ** (2.1)	32.8 (1.4)	32.0 (1.5)	33.0 (1.5)	31.4 (1.0)	59.8 (6.1)	82.2 ** (2.3)	5.1 (0.5)	9.8 (0.6)
Santa Clara	33	15	53.8 (2.4)	27.9 ** (2.2)	35.4 (1.7)	44.7 ** (5.2)	54.2 (1.6)	43.8 ** (2.0)	58.8 (1.1)	47.5 ** (2.4)	98.3 (7.2)	98.5 (7.4)	25.2 (1.4)	19.1 ** (1.0)
Stanislaus	37	11	29.2 (0.9)	40.2 ** (1.9)	16.3 (0.7)	21.9 ** (1.1)	22.1 (0.9)	23.4 (1.3)	29.3 (1.0)	26.9 (1.5)	65.5 (6.6)	96.1 ** (10.6)	7.5 (0.8)	8.4 (1.2)

Provider Category (mean, s.e.)

Expansion County	Months in Period N Pre	N Post	Hospital—Outpatient Non-Mandatory Pre	Non-Mandatory Post	Mandatory Pre	Mandatory Post	Hospital—Inpatient Non-Mandatory Pre	Non-Mandatory Post	Mandatory Pre	Mandatory Post	Rehabilitation Facility Non-Mandatory Pre	Non-Mandatory Post	Mandatory Pre	Mandatory Post
Tulare	48	0	14.6 (0.9)	—	8.3 (0.6)	—	19.9 (0.7)	—	24.2 (0.8)	—	13.1 (0.7)	—	5.4 (0.4)	—
COHS counties[b]														
Orange	21	27	15.7 (1.2)	48.9 ** (3.2)	55.4 (1.9)	379.7 ** (25.5)	44.5 (1.2)	49.3 ** (1.3)	144.7 (2.9)	159.2 ** (3.8)	15.1 (2.7)	29.0 ** (2.7)	164.4 (26.0)	240.3 ** (25.4)
Santa Cruz	24	24	4.3 (0.4)	3.2 * (0.4)	24.7 (1.8)	67.3 ** (1.8)	5.6 (0.6)	5.7 (0.6)	20.8 (1.0)	21.4 (1.1)	0.8 (0)	0.7 (0)	28.3 (0)	29.1 (0)

Total months in the observed Pre and Post periods correspond to carve-out dates for each county

[a] Means for all county-months in Pre and Post periods

[b] Mandatory and non-mandatory groups defined according to Two Plan expansion criteria

[c] Mandatory and non-mandatory groups defined according to COHS expansion criteria

* Test of equality of means (Pre vs. Post), $p < 0.10$

** Test of equality of means (Pre vs. Post), $p < 0.05$

Table 6.22A – Changes in total recipients by provider type—Two Plan and non-expansion counties, for children in mandatory managed care groups (Coefficients and t statistics)

Variable	Provider Category									
	Physician Services (Office, outpatient, ER, home)		Physician Services (Inpatient)		Pharmaceuticals		Hospital Services (Inpatient)		Hospital Services (Outpatient)	
	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)
Percent MCP (pct2cpli)	0.013 (4.363)	0.012 (4.054)	0.012 (4.058)	0.012 (5.476)	0.002 (1.171)	0.002 (0.997)	0.002 (2.022)	0.002 (1.528)	0.016 (3.781)	0.015 (4.041)
Post carve-out (post)	-0.228 (2.919)	-0.339 (2.740)	-0.070 (0.520)	0.036 (0.408)	0.045 (0.528)	-0.137 (1.334)	-0.062 (1.807)	-0.029 (0.519)	-0.169 (1.020)	-0.182 (1.453)
log Medi-Cal enrolled (ln_s_enr)	3.110 (3.669)	1.715 (1.698)	3.658[a] (5.869)	1.963 (2.394)	0.180 (0.182)	-0.323 (0.388)	2.035 (4.460)	1.159 (1.841)	2.457 (2.049)	1.289 (1.407)
Percent PHP (pct2_php)	0.013 (0.778)	0.017 (1.303)	0.020 (3.437)	0.020 (4.109)	-0.002 (0.446)	-0.004 (0.655)	-0.006 (1.711)	-0.002 (0.665)	-0.004 (0.264)	-0.002 (0.180)
1995	0.142 (1.867)	0.052 (0.950)	-0.113 (1.931)	-0.128 (1.859)	0.204 (2.401)	0.236 (4.109)	-0.018 (0.445)	-0.090 (1.633)	0.129 (1.664)	0.043 (0.686)
1996	0.080 (0.666)	0.080 (0.929)	-0.139 (1.295)	-0.202 (2.314)	0.310 (3.050)	0.195 (2.551)	-0.031 (0.709)	-0.151 (2.774)	0.292 (2.131)	0.245 (3.793)
1997	0.392 (1.974)	0.479 (2.550)	0.367 (1.387)	-0.001 (2.726)	0.373 (3.328)	0.237 (2.033)	0.100 (1.635)	-0.020 (0.272)	0.580 (2.188)	0.478 (4.182)
R squared	0.91	0.90	0.87	0.89	0.90	0.91	0.96	0.93	0.90	0.90
N	576	1,104	576	1,104	576	1,104	576	1,104	576	1,104

N is total county-months. Each model includes percent PHP participation and 3 season dummy variables (omitted season is Jan-Mar) and the omitted year is 1994. The dependent variable is log of monthly expenditures, or log of total monthly expenditures per claimants.
(1) Model includes the Two Plan counties, with fixed county effects and referent Tulare
(2) Model includes the Two Plan counties and 11 non-expansion counties, with fixed county effects and referent Tulare
[a] Can reject hypothesis that ln_s_enr=1, $p < 0.05$
Regressions report White-corrected standard errors with assumption of independence within groups (county) relaxed.

Table 6.22B – Changes in total recipients by provider type—Two Plan and non-expansion counties, for children in non-mandatory managed care groups (Coefficients and t statistics)

Variable	Physician Services (Office, outpatient, ER, home)		Physician Services (Inpatient)		Pharmaceuticals		Hospital Services (Inpatient)		Hospital Services (Outpatient)	
	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)
Percent MCP (pct2cpli)	0.127 (4.788)	0.106 (4.020)	0.098 (3.061)	0.108 (4.195)	0.024 (2.897)	0.005 (0.442)	0.024 (2.445)	0.022 (1.754)	0.109 (2.864)	0.105 (3.497)
Post carve-out (post)	-0.200 (1.368)	-0.311 (2.099)	-0.236 (1.688)	-0.179 (1.481)	0.033 (0.848)	-0.072 (1.287)	-0.128 (2.127)	-0.137 (2.859)	-0.264 (1.659)	-0.262 (1.655)
log Medi-Cal enrolled (ln_s_enr)	3.484 (1.788)	5.137 (2.923)	3.492 (2.887)	2.946 (2.223)	-0.553 (0.526)	-0.864 (1.207)	1.580 (2.880)	0.751 (0.919)	2.983 (1.869)	1.513 (1.418)
Percent PHP (pct2_php)	0.081 (1.985)	0.096 (2.544)	0.098 (2.671)	0.094 (3.653)	0.063 (5.337)	-0.033 (2.401)	0.020 (0.958)	-0.010 (0.363)	0.055 (1.344)	0.063 (2.520)
1995	-0.105 (1.370)	-0.223 (3.076)	-0.113 (1.537)	-0.137 (1.744)	0.124 (2.240)	0.051 (0.746)	-0.035 (0.833)	-0.052 (0.957)	0.034 (0.639)	0.013 (0.178)
1996	-0.357 (2.659)	-0.462 (3.571)	-0.348 (2.397)	-0.354 (2.534)	-0.231 (1.963)	0.214 (2.184)	-0.060 (0.902)	0.013 (0.172)	0.062 (0.489)	0.079 (0.760)
1997	-0.212 (1.333)	-0.072 (0.507)	-0.111 (0.461)	-0.237 (1.404)	0.357 (2.754)	0.466 (4.271)	0.028 (0.333)	0.054 (0.636)	0.155 (0.691)	0.253 (0.895)
R squared	0.95	0.91	0.91	0.90	0.96	0.96	0.96	0.94	0.96	0.94
N	576	1,104	576	1,104	576	1,104	576	1,104	576	1,104

N is total county-months. Each model includes percent PHP participation and 3 season dummy variables (omitted season is Jan-Mar) and the omitted year is 1994. The dependent variable is log of monthly expenditures, or log of total monthly expenditures per claimants.

(1) Model includes the Two Plan counties, with fixed county effects and referent Tulare

(2) Model includes the Two Plan counties and 11 non-expansion counties, with fixed county effects and referent Tulare

[a] Can reject hypothesis that ln_s_enr=1, $p<0.05$

Regressions report White-corrected standard errors with assumption of independence within groups (county) relaxed.

Claimants with Provider Type Claim, as Proportion of All Monthly Claimants

Weighted (by claimant volume) bivariate pre and post comparisons in Two Plan counties showed that for several provider types, individuals with that provider type claim increased as a percent of total monthly claimants, for both mandatory and non-mandatory groups in the expansion counties (data not shown). However, some of the bivariate results were sensitive to inclusion of Los Angeles. Including Los Angeles, the groups with pre-post increases for both mandatory and non-mandatory groups were pharmacy (22 to 26 percent for mandatory, 10 to 13 percent for non-mandatory); outpatient hospital (26 to 34 percent for mandatory, 25 to 27 percent for non-mandatory); and rehabilitation hospital (9 to 10 percent for mandatory, 25 to 29 percent for non-mandatory). Only the mandatory group showed an increase for physician inpatient (from 12 to 15 percent), and both groups showed declines for the proportion of claimants having claims for ambulatory physician services (32 to 30 percent for mandatory, 26 to 22 percent for non-mandatory), and for hospital inpatient services (31 to 29 percent for mandatory, 18 to 16 percent non-mandatory). Without Los Angeles, both groups showed an increased proportion of claimants receiving CCS-authorized ambulatory physician services, but the pre-post difference in pharmacy disappeared. The fact that Los Angeles did not experience a post carve-out increase in the percent of claimants receiving ambulatory physician services thus outweighs the increases experienced among the smaller Two Plan counties. At the same time, Los Angeles drove the pre-post difference (increase) in pharmaceutical recipients as a proportion of claimants.

Implications are provided with the discussion of multivariate findings below. First findings for claimant volume by type are presented. This is followed by multivariate results for recipients as a percent of monthly claimants.

Multivariate Analysis of Changes to *Claimant Volume by Provider Type*

Results from multivariate specifications combining the Two Plan expansion and non-expansion counties are provided in **Table 6.22A, Changes in total recipients by provider type—Two Plan and non-expansion counties, for children in mandatory managed care group**, and in **Table 6.22B**.

Ambulatory physician and outpatient hospital services Multivariate analysis for Two Plan and non-expansion counties showed increased claimants for ambulatory physician services. Positive associations with MCP participation were found for both mandatory and non-mandatory groups and changed little when the eleven non-expansion counties were included (Model 2 in **Table 6.22A** and **Table 6.22B**). A significant year dummy for 1997 for the mandatory group reflected the trend encompassing both expansion and non-expansion counties. This finding indicated a 61 percent increase for the mandatory group for 1997 relative to 1994. Recipients of hospital outpatient services also increased with MCP participation in both groups with little change to the coefficients for the MCP variable when non-expansion counties were included.

Pharmaceuticals   Increased managed care participation was associated with higher recipient volume only in the non-mandatory group, but the effect disappeared when the non-expansion counties were included. There was not a significant change associated with MCP participation in the mandatory group. The significant increasing time trend found in this multivariate analysis of pharmaceutical expenditures was expected given the bivariate finding of increasing monthly claimants. Coupled with the insignificant multivariate finding for the mandatory group, time trend findings suggest that the mechanism for increasing pharmaceutical recipients in the Two Plan counties' mandatory and non-mandatory groups was not the monthly rate of MCP participation.

Inpatient physician and inpatient hospital services   Monthly claimants with inpatient physician services increased with greater MCP participation for both groups. The number of beneficiaries with an inpatient hospital claim appeared to increase with greater managed care participation, although the effect only approached but did not reach statistical significance when non-expansion counties were included ($p=0.09$ for the non-mandatory group, $p=0.14$ for the mandatory group). (Using a post indicator for the initial carve-out months and another indicator for the post default months, the coefficient for the post default indicator indicated a 12 percent increase that was not significant ($p=0.33$) for the mandatory group (data not shown)). There also was no evidence of an independent time trend in monthly claimants with inpatient hospital services. It was expected that hospital inpatient services would not be as sensitive as other service types to carve-out incentive effects. It appears that referral of hospitalized children who would otherwise not be referred to CCS is not the primary explanation for the overall increased claimant volume. Both recipient volume measures would be expected to increase if that happened. Instead, the finding is consistent with increased CCS authorized physician services for those children whose inpatient stay payment source was what it would have been in the pre carve-out period (i.e., authorized by Medi-Cal or by CCS). The fact that the coefficients approached significance does suggest that on the margin, there may have been hospital stays in the pre carve-out period that could have been but were not authorized by CCS.

Finally, as expected, the coefficient for Medi-Cal enrollment was positive but usually not different from zero in the combined expansion and non-expansion county specifications. There was a significant association only for physician ambulatory services, physician inpatient services, and hospital inpatient (mandatory group only) in both groups. The hypothesis of a one percent Medi-Cal enrollment increase causing a concomitant one percent increase in claimant volume for a given provider type could be rejected only for inpatient physician recipients for the mandatory group. The measure of PHP participation used to control for "CCS-include" participation in the pre carve-out period was positively associated with recipient volume in several categories in the non-mandatory group but generally was not significant for the mandatory group. There was no indication of lower claimant volume associated with PHP participation in any group or county, using the combined expansion and non-expansion county specification.

In summary, recipients of ambulatory physician services, outpatient hospital services, and inpatient physician services increased with MCP participation for the mandatory and non-mandatory groups. as did pharmacy and inpatient physician service recipients. Notably, the non-mandatory group increase in pharmacy recipients appeared not to be caused by MCP participation rates directly.

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Recipients of hospital inpatient services did not increase although somewhat surprisingly, there was a trend toward increased recipient volume in the non-mandatory group (p=0.09). These findings show that even in comparison to the non-expansion counties, there was greater volume of recipients of ambulatory services (and physician inpatient services) as managed care participation increased, among mandatory and non-mandatory beneficiaries.

Multivariate Analysis of *Expenditures among Claimants with Provider Type Claim*

A key question is not only whether expenditures per claimant change with the carve-out, but whether mean monthly expenditures change among those who use the particular type of service. Alternatively, the dominant effect on expenditures could be increased claimant volume within each of the service types with no impact on per claimant expenditure within the group of service users. For example, an increase in claimants receiving the mean expenditure among the given recipient group would not alter the mean even as volume increased. Earlier analysis focused on changes to expenditures per total claimants. That measure captures trends for the full claimant population. This measure captures intensity of expenditures per claimant receiving that type of service.

If there is no change in expenditures per total claimants but an increase in intensity (defined as expenditures) per recipient (defined as claimants with one or more claims for the provider type), there are several possible inferences for carve-out impact. One is that entry of higher cost-intensity recipients increased, but the provider type was not a large enough component of all expenditures to shift the measure of expenditures per total claimants. Another is that there was increased use of the service by "existing" claimants or increased use by these claimants in addition to newly identified eligibles, which resulted in a net increase of per recipient expenditures. If there is no change in expenditures per total claimants but a decline in intensity per recipient, a possible inference is that expanded claimant volume brought down the mean expenditure per claimant within the provider type but was not significant enough to alter the measure of expenditures per total claimants. If there is an increase in expenditures for the provider type per total claimants but no change in per claimant expenditures among claimants with the provider type, a possible inference is that expenditures on these types of service increases overall but that mean expenditures among recipients does not change (either due to increased volume with the same expected monthly cost, or no net change despite compositional changes). If there are more monthly claimants with low expenditures in certain service types, then overall expenditures per claimants could drop while only these selected provider type categories would show a change when analyzed separately.

For example, it is possible to have higher pharmacy expenditures among those who receive pharmaceuticals even if pharmaceutical expenditures per total monthly claimants declines due to carve-out induced entry of new claimants who do not have CCS-authorized pharmaceuticals. As another example, inpatient expenditures per total monthly claimants could increase as more NICU stays are identified as CCS-eligible and are referred to CCS. This could result in higher inpatient expenditures per recipient of CCS-authorized inpatient services (depending on the NICU expenditures) even as influx occurs of claimants with lower monthly expenditures. As earlier, it is important to note that for service such as physician office services, time effects are important. An

overall increase was expected due to an enhanced CCS role in authorizing such services, and thus an across-the-board increase per claimant was anticipated irrespective of any carve-out effect.

The following analysis examined whether the intensity of services—as measured by expenditures—changed among those claimants who had a particular type of claim within the month. The discussion shows how findings for expenditure per total claimants compare to findings for expenditure per total claimants with that provider type. The specific hypotheses for each provider type also with the results from bivariate and multivariate analyses for the Two Plan and non-expansion counties are integrated in the paragraphs that follow. Multivariate results are provided in **Table 6.23A, Changes in expenditures per recipients by provider type—Two Plan and non-expansion counties, for children in mandatory managed care group** and in **Table 6.23B** for the non-mandatory group.

Ambulatory physician and outpatient hospital services A growing number of children receiving CCS authorized services in the post carve-out period may have diagnoses that incur a greater proportion of ambulatory services (physician or hospital outpatient) and fewer hospital inpatient services. If this occurs, then expenditures per total claimants could fall while there is no change in the mean expended per child receiving ambulatory services. The net effect depends on the composition and variability within the group. As indicated in **Table 6.22A** and **Table 6.22B**, the volume of claimants receiving ambulatory physician services had increased with the carve-out. Earlier results showed that expenditures per monthly claimants increased only for the non-mandatory group (and COHS mandatory group) when the combined expansion and non-expansion county specification was used (**Tables 6.20A, 6.20B, 6.19**). Results combining the expansion and non-expansion counties in **Table 6.22A** show that expenditures per recipient of ambulatory physician services declined with increasing managed care participation, for the mandatory group (Model 2). This indicates that intensity of these services per recipient declined with the carve-out, possibly due to increased volume of claimants with lower expected ambulatory costs, even as expenditures per monthly claimants increased. The same pattern of higher ambulatory physician expenditures per claimant, and lower expenditures per recipient, occurred for the non-mandatory group.

The same pattern occurred for hospital outpatient services. The exception was that the coefficient for managed care participation in the non-mandatory group was not significant, for the outcome of expenditures per total recipients. The finding for ambulatory expenditures per total recipients does not suggest greater intensity of these services (as represented by cost) among utilizers in a given month. In fact, it suggests lower intensity of these services among utilizers. This generally held for physician services and for hospital outpatient services.

Pharmaceuticals There was no clear hypothesis for pharmaceutical expenditures per recipient. A possibility is that per claimant pharmaceutical expenditures would decline due to increased authorization for a more diverse group of claimants. Among those in the mandatory group with a pharmacy claim in a month, mean pharmacy expenditures had increased post carve-out for five (5) of the eleven (11) Two Plan counties with a decline in only one (1) county, which was Santa Clara.

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Table 6.23A – Changes in expenditures per total recipients by provider type—Two Plan and non-expansion counties, for children in mandatory managed care groups (Coefficients and t statistics)

Variable	Provider Category									
	Physician Services (Office, outpatient, ER, home)		Physician Services (Inpatient)		Pharmaceuticals		Hospital Services (Inpatient)		Hospital Services (Outpatient)	
	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)
Percent MCP (pct2cpli)	-0.002 (0.988)	-0.007 (2.381)	0.001 (0.787)	-0.000 (0.037)	0.001 (0.517)	-0.003 (0.923)	-0.001 (3.147)	-0.002 (1.949)	-0.003 (2.052)	-0.003 (2.537)
Post carve-out (post)	0.196 (1.593)	-0.054 (0.448)	0.056 (0.589)	0.019 (0.176)	0.015 (0.108)	-0.172 (0.826)	-0.067 (1.400)	0.113 (1.144)	0.056 (0.613)	-0.032 (0.372)
log Medi-Cal enrolled (ln_s_enr)	0.738 (0.535)	-1.125 (0.751)	-0.007[a] (0.017)	-0.868[a] (1.016)	0.133 (0.085)	-1.523 (0.636)	-0.586[a] (1.672)	-0.767 (0.834)	0.380 (0.659)	0.582 (1.126)
Percent PHP (pct2_php)	0.000 (0.027)	-0.002 (0.316)	0.005 (0.896)	0.004 (0.636)	-0.007 (0.828)	-0.024 (1.509)	0.001 (0.865)	0.003 (0.884)	0.003 (0.617)	-0.002 (0.487)
1995	-0.428 (5.958)	-0.394 (3.128)	-0.130 (2.268)	-0.270 (0.222)	0.044 (0.574)	0.276 (1.921)	-0.027 (1.007)	-0.127 (1.288)	-0.171 (2.152)	-0.182 (2.369)
1996	-0.101 (0.674)	0.017 (0.113)	-0.120 (2.118)	-0.122 (1.918)	0.225 (1.370)	0.446 (2.671)	-0.005 (0.136)	-0.178 (1.652)	-0.170 (1.389)	-0.061 (0.748)
1997	-0.157 (0.977)	0.253 (1.620)	0.132 (1.141)	-0.122 (0.569)	0.256 (0.921)	0.654 (1.896)	-0.141 (3.067)	-0.182 (2.331)	-0.150 (1.164)	-0.008 (0.099)
R squared	0.21	0.23	0.38	0.27	0.40	0.45	0.29	0.15	0.26	0.24
N	576	1,104	576	1,104	576	1,104	576	1,104	576	1,104

N is total county-months. Each model includes 3 season dummy variables (omitted season is Jan-Mar) and the omitted year is 1994. The dependent variable is log of total monthly expenditures per claimants.
(1) Model includes the Two Plan counties, with fixed county effects and referent Tulare
(2) Model includes the Two Plan counties and 11 non-expansion counties, with fixed county effects and referent Tulare
[a] Can reject hypothesis that ln_s_enr=1, p<0.05
Regressions report White-corrected standard errors with assumption of independence within groups (county) relaxed.

Table 6.23B – Changes in expenditures per total recipients by provider type—Two Plan and non-expansion counties, for children in non-mandatory managed care groups (Coefficients and t statistics)

Variable	Provider Category									
	Physician Services (Office, outpatient, ER, home)		Physician Services (Inpatient)		Pharmaceuticals		Hospital Services (Inpatient)		Hospital Services (Outpatient)	
	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)	Two Plan (1)	Two Plan & 11 ctys (2)
Percent MCP (pct2cpli)	-0.005 (0.162)	0.012 (0.416)	-0.001 (0.029)	0.025 (0.628)	-0.047 (4.375)	-0.040 (3.185)	0.010 (0.668)	-0.005 (0.329)	-0.006 (0.327)	-0.030 (1.430)
Post carve-out (post)	0.084 (0.581)	0.085 (0.706)	-0.009 (0.095)	-0.088 (0.654)	-0.029 (0.451)	0.070 (0.768)	-0.024 (0.563)	-0.106 (2.079)	0.093 (0.622)	0.061 (0.474)
log Medi-Cal enrolled (ln_s_enr)	3.401 (1.477)	0.110 (0.057)	-0.524 (0.393)	0.052 (0.028)	-1.971[a] (1.577)	-1.120 (0.565)	0.298 (0.392)	0.824 (0.933)	-0.108 (0.085)	-0.912 (0.806)
Percent PHP (pct2_php)	0.048 (1.043)	0.107 (3.058)	0.021 (0.652)	0.176 (1.256)	-0.072 (4.621)	-0.080 (4.205)	0.017 (1.133)	0.021 (0.791)	0.051 (2.016)	0.055 (1.494)
1995	-0.247 (2.368)	-0.134 (1.282)	-0.079 (1.892)	-0.044 (0.359)	0.088 (0.806)	0.252 (1.726)	-0.044 (0.937)	-0.062 (0.674)	-0.181 (3.163)	-0.122 (3.036)
1996	-0.095 (0.546)	0.004 (0.027)	-0.070 (0.613)	-0.075 (0.354)	-0.346 (1.937)	0.302 (1.893)	-0.014 (0.156)	0.117 (1.262)	-0.226 (3.225)	-0.242 (1.829)
1997	-0.157 (0.807)	0.164 (0.967)	-0.006 (0.053)	-0.112 (0.407)	0.539 (3.116)	0.396 (2.655)	0.106 (1.100)	0.167 (0.284)	-0.309 (4.161)	-0.047 (0.486)
R squared	0.26	0.32	0.18	0.26	0.38	0.24	0.21	0.12	0.30	0.19
N	576	1,104	576	1,104	576	1,104	576	1,104	576	1,104

N is total county-months. Each model includes 3 season dummy variables (omitted season is Jan-Mar) and the omitted year is 1994. The dependent variable is log of total monthly expenditures per claimants.
(1) Model includes the Two Plan counties, with fixed county effects and referent Tulare
(2) Model includes the Two Plan counties and 11 non-expansion counties, with fixed county effects and referent Tulare
[a] Can reject hypothesis that ln_s_enr=1, p<0.05
Regressions report White-corrected standard errors with assumption of independence within groups (county) relaxed.

A significant increase per claimant was found for the non-mandatory group in six (6) of the eleven (11) counties with no counties showing a decline.

Both per claimant and per recipient expenditures on pharmaceuticals declined for the non-mandatory group (**Table 6.23B**). There was no change in per recipient expenditures for the mandatory group (**Table 6.23A**). Thus in summary, there was lower intensity of expenditures per recipient as MCP participation increased in the non-mandatory group. The contribution that any possible differences in types of pharmaceuticals used by the different groups might make to these findings, pre and post carve-out, is not known. Year effects suggested a time trend common to both Two Plan and the eleven non-expansion counties of higher monthly expenditures among those with at least one pharmacy claim. This held for both mandatory and non-mandatory groups.

Inpatient hospital   For the mandatory group, both per recipient and per claimant expenditures on hospital inpatient services declined for the mandatory group as managed care participation increased. However, the number of monthly recipients had indicated a trend toward a positive association in the mandatory group (p=0.09) though no change for the non-mandatory group (p=0.14). These findings suggest that for the mandatory group of beneficiaries, the cost intensity of the inpatient services. If total recipients did increase, then it seems likely that the greater volume of recipients included a greater proportion of children with lower than average cost intensive services. In contrast, for the non-mandatory group, neither measure was associated with the carve-out nor did recipient volume increase.

In summary, increased managed care participation in the mandatory group appeared to be associated with lower CCS authorized expenditures per recipient of services, for ambulatory services (physician and hospital outpatient) and for hospital inpatient services. The types of services for which expenditures per recipient did not decline (or show a strong trend toward a decline) were physician inpatient services and pharmaceuticals. For the non-mandatory group, the only significant association with increasing managed care participation was found for pharmaceuticals, for which per recipient expenditures declined.

The multivariate results also suggested some time trends for expenditures per recipients (for that provider type) that were independent of the carve-out effect. In the Two Plan counties (combined with non-expansion counties), a positive time trend for 1996 and/or for 1997 was found for pharmaceuticals in the non-mandatory and mandatory groups and a negative time trend was found for hospital inpatient services in the mandatory group. A positive time trend for pharmaceuticals indicates increased volume of services per claimant, higher amounts paid per service(s), or a combination. Finally, it should be noted that rates to physicians generally did not increase over the study period (SDHS 2000; Medi-Cal Policy Institute 2000), and this points to increased volume of services or service-mix changes, rather than fee changes, as a contributor to expenditure changes.

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Multivariate Analysis of *Claimants with Provider Type Claim as Proportion of Total Monthly Claimants*

Pre and post carve-out bivariate findings (data not shown) had showed several changes for the percent of all claimants who had one or more claims of a given provider type. In weighted (by claimant volume) Two Plan County pre-post comparisons, effects for ambulatory services were mixed.[81] Recipients of pharmaceuticals increased as a proportion of claimants in both groups, from 22 to 26 percent in mandatory and from 10 to 13 percent in non-mandatory. However, ambulatory physician services declined from 26 to 22 percent (non-mandatory) and from 32 to 30 percent (mandatory). Earlier analysis had indicated an increased proportion when Los Angeles was excluded. Other mandatory group increases included hospital outpatient and rehabilitation categories. As expected, recipients of inpatient services declined as a percent of monthly claimants, from 18 to 16 percent of non-mandatory and from 31 to 29 percent of mandatory group claimants.

Multivariate results (data not shown) confirmed that recipients of different types of ambulatory services increased as a proportion of total monthly claimants. These results are based on a specification combining Two Plan and the eleven non-expansion counties, with monthly recipients as a proportion of monthly claimants as the dependent variable. Recipients of ambulatory services increased as a percent of monthly claimants with the carve-out for both mandatory and non-mandatory groups. This included physician ambulatory services and hospital outpatient services. Recipients per monthly claimants also increased for physician inpatient services, as managed care participation increased. Recipients of pharmaceuticals declined as a proportion of monthly claimants for the mandatory group but did not change for the non-mandatory group (p=0.14). As expected, hospital inpatient recipients declined as a proportion of claimants in the mandatory group with no change for the non-mandatory group. These findings help to summarize the compositional changes in the kinds of services received as claimant volume increased with growing managed care participation.

6.5.4 Summary of Findings for Expenditures by Type of Provider

To summarize earlier expenditure pattern findings, analysis of total monthly CCS-authorized expenditures had revealed mixed changes associated with the carve-out (Section **6.2**). An increase was found for only one county in the mandatory group and one county in the non-mandatory group. Positive coefficients for the combined Two Plan counties were not statistically significant for the mandatory group when combined with the eleven non-expansion counties. Only the non-mandatory group models (when combined with eight rather than the eleven comparison counties) and the models including the two COHS expansion counties (when combined with the eight comparison counties) provided evidence that the carve-out/managed care expansion was associated with increased expenditures for the aggregated groups. and only the specifications for the SSI Medi-Cal aid category showed this effect. It is possible that the dominance of inpatient expenditures as a proportion of

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[81] Using unweighted monthly percentages, the proportion of claimants in Two Plan counties increased for physician inpatient and hospital outpatient services but declined for hospital inpatient, rehabilitation hospital, and "other" services. No changes were found to be associated with the carve-out in the non-mandatory group.

CCS-authorized expenditures is masking effects in other types of services. Per claimant expenditure trends and changes to the distribution of per claimant expenditure had suggested a decline in CCS service intensity among monthly claimants associated with the carve-out.

The following summary reports findings from combined expansion and non-expansion county models. Patterns of total monthly expenditure by provider type showed increased expenditures for physician inpatient and for hospital outpatient services for both mandatory and non-mandatory groups in Two Plan counties. Expenditures for physician ambulatory services and pharmaceuticals did not increase for the Two Plan counties as expected. Findings for claimant volume by provider type did support the study hypotheses. The composition of claimants with respect to types of services received did change with the carve-out. The rate of managed care participation was associated with increased volume of children receiving CCS-authorized ambulatory physician services; services in hospital outpatient settings; and physician inpatient services. These findings held for mandatory and for non-mandatory groups. No changes in recipient volume were found for pharmaceuticals in either group, and inpatient service recipients showed trends toward decline in both groups that were not significant.

Expenditures per total monthly claimants were generally consistent across groups as well. Increased managed care participation was associated with increases for physician inpatient services and hospital outpatient services but with declines for pharmaceuticals. Only the mandatory group showed a significant effect for inpatient expenditures per monthly claimants (which was negative). COHS counties had a different mandatory group composition. Managed care participation in those counties was associated with greater expenditures per claimant for pharmaceuticals (the association was positive for physician ambulatory services but not significant at p,0.05) and lower expenditures per claimant for hospital inpatient services.

Analysis of expenditures per recipient helps show whether more children are receiving (on average) lower cost intensity services in a given month. Findings for expenditures per recipient of a given provider type claim also were consistent with the study hypotheses in the Two Plan counties. On average, the cost-intensity of services per recipient declined with the carve-out for the mandatory group. Physician office expenditures, hospital outpatient expenditures, and hospital inpatient services declined per claimant receiving those services. For the non-mandatory group, expenditures per claimant receiving the type of service declined only for pharmaceuticals.

These comparisons control for practice pattern changes and other unknown effects to the extent possible. A plausible explanation is that the carve-out stimulated a set of referral changes that had a greater effect on ambulatory than on inpatient services. Finally, it is worth considering whether some of the changes stimulated by the carve-out policy extended not only to the non-mandatory group (due to a combination of provider and agency practice changes) and to the non-expansion counties (due to agency practice changes). The assertion that the carve-out affected non-expansion counties as well as expansion counties is plausible based on other research on learning effects (e.g., Sturm 1999; consistent with regionalized Medi-Cal and CCS authorization functions; and supported by the interviews with several CCS program administrators.

CHAPTER 7—CONTEXTUAL ANALYSIS OF CARVE-OUT POLICY

As discussed in Chapter 4 (Research Design and Methods), the contextual analysis of the carve-out policy examines the experiences and observations of CCS agency staff with the carve-out. Interviews with CCS program administrators were conducted in several California counties. This Chapter describes the purpose and approach as well as the overall findings from the qualitative interviews.

7.1   Rationale and Content of Interviews

The interviews evaluate possible underlying differences across counties that could lead to different caseload and expenditure outcomes. Although CCS county agencies operate under State program rules for eligibility and authorization, there may be slight operational differences between carve-out counties. Results from the quantitative analyses suggest slight differences in CCS program participant composition with respect to diagnosis, for example. There might be pre carve-out differences in proclivity to refer to CCS. Organizational characteristics of the local health plans, the local provider networks, or the local CCS program also may have influenced carve-out impact. New organizational relationships between health plans, providers, and CCS were established with the carve-out, and different health plans operate in the different expansion counties. Even within the group of counties that share the Two Plan model, the Local Initiative plans differ in their provider network arrangements. For example, the Los Angeles Local Initiative does not contract directly with providers and instead subcontracts with a set of commercial managed care organizations.

In addition, the managed care expansion and the CCS carve-out may not have been the only significant factors influencing referral to CCS, and CCS authorization practices, during the study period. For example, carve-out effects or program changes that are separate from the provider incentives could cause changes in CCS program participation that affect both the mandatory and non-mandatory eligible groups. Pre carve-out differences in Medi-Cal field office policies and procedures might have occurred across counties. This could help to explain why differences between the mandatory and non-mandatory groups were not always found in the quantitative analyses. Finally, because Medi-Cal and CCS are complex programs, direct information from the counties about implementation also contributes to a better understanding of the carve-out impact.

The general domains and specific topics covered in the qualitative interviews were summarized in Chapter 4. The primary objectives include the following:

1. Identifying unique aspects of the carve-out implementation and impact across counties;
2. Identifying CCS agency perspectives on how prepaid health plans and providers have responded to the carve-out;
3. Identifying significant program changes during the study period, for the CCS program and for Medi-Cal as it relates to CCS;
4. Assessing the organizational impact of the carve-out on CCS agencies; and

5. Identifying any data on policy impact that are available to county CCS programs.

Site Selection and Methods

Counties in which the interviews took place included Alameda, Contra Costa, Kern, Los Angeles, and Orange counties. These counties were selected to provide variation in the following characteristics: (1) diversity of county size and geography (which was expected to also provide variation in relevant health system characteristics); (2) a mix of COHS and Two Plan model counties; and (3) differences in Local Initiative models and organization within the subset of Two Plan counties. **Figure 3.2, Authorization sources by county: Assigned regional CCS office and Medi-Cal field office**, shows that the selected counties come from all three of the CCS regional offices in Sacramento, San Francisco, and Southern California. Taken together, the counties also are assigned to four different Medi-Cal field offices of the seven regional offices in California. The counties also vary in claimant volume and include some of the largest and the smallest expansion counties. As illustrated in **Table 5.1**, mean monthly CCS claimant volume for calendar year 1997 in these counties was as follows: 184 (Contra Costa); 253 (Kern); 460 (Alameda); 939 (Orange); and 4,173 (Los Angeles).

An interview also was conducted with an administrator of the State Department of Health Services, Children's Medical Services Branch. This provided a statewide perspective as well as insight into post carve-out changes occurring within the non-expansion counties that are dependent counties (i.e., that do not operate local CCS programs).

These interviews were conducted between April 1999 and November 1999. When both the medical director and nurse administrator(s) were interviewed in a program office, these interviews were conducted separately. Six of the eight interviews were conducted in-person with two conducted by telephone. The number of individuals interviewed in each county ranged from one person to three persons. Key local CCS program staff who participated in the interviews included some or all of the following individuals in a given CCS program: medical directors/medical consultants; program administrators; and nurse administrators who serve as liaisons with the managed care plans. For purposes of preserving confidentiality, in discussing the interview results these study participants are all referred to as CCS program staff or as CCS administrators.

In general, program administrators were asked to focus their responses on the period from 1994 to 1997, or on the specific carve-out implementation period for their county within that time period. This was important due to significant post-1997 changes such as implementation of California's State Child Health Insurance Program (SCHIP)[82], "Healthy Families", which posed new demands on

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[82] The Social Security Act was amended by the Balanced Budget Act of 1997 to include Title XXI. This amendment provided federal matching funds in the form of block grants to states to extend health insurance to children in low-income families. States were permitted to expand eligibility for Medicaid, to create new state-only insurance programs separate from Medicaid, or to expand Medicaid and create a state-only program. California's child health insurance expansion was not effective during the study period.

the CCS program and may have had an independent effect on the Medi-Cal/CCS carve-out impact. In some instances, program administrators anchored their responses to the pre carve-out/managed care expansion period in their county but reported on referral practices that were current at the time of the interview (i.e., 1999) rather than the time period immediately following implementation. In such instances, the reported time period is clearly identified in the findings presented in this section.

7.2   Findings from Interviews with CCS Program Administrators

The findings from the interviews with CCS program administrators are summarized in the following section. The section is organized by the general topics outlined above. First, administrators were asked about response to the CCS carve-out on the part of health plans and providers: How had awareness about CCS changed after the carve-out policy was implemented? What changes had occurred in the volume of referrals received by CCS? What was the timing of such changes, relative to the carve-out effective date? Administrators also were asked about the nature of referrals since the carve-out effective date: Were changes observed in the types of referrals received? Had the likelihood that a given referral would result in an eligible child changed over time? Administrators also were asked about features of the pre and post carve-out periods in the county with respect to CCS referrals: Was there significant "circumvention" of CCS prior to the carve-out? Were there particular areas where disputes over responsibility for services were occurring? Were there differences in how the Local Initiative and the Commercial Plan operated under the carve-out? What was the role of the Medi-Cal field offices? Finally, administrators were asked about CCS program changes that were attributable to the carve-out: What changes had occurred in CCS program capacities, if any? What capacities would have facilitated CCS response to the demands of the carve-out? What changes had occurred to the CCS program independent of the carve-out?

A similar protocol was used for the interview with state CMS with slight modifications. Specific questions used for this interview included the following: Have there been (historically) differences among the counties in what the Medi-Cal field offices have authorized and referred to CCS? What patterns of circumvention if any were thought to have occurred, and did this circumvention continue to occur in non-expansion counties, and in expansion counties that maintain Medi-Cal FFS for non-mandatory beneficiaries? Had referral volume appeared to change in the non-expansion counties also? Had any impact of the carve-out/expansion on referrals, and/or caseload, been perceived for the counties that do not have independent CCS programs?

Referral of Children to CCS

Discussion of the CCS referral process included questions about the entities involved in making CCS referrals and how referral patterns had changed since the carve-out effective date.[83] It was

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[83] The content of the interview focused on referrals and CCS program changes with respect to child Medi-Cal beneficiaries with possible CCS-eligible medical diagnoses. While CCS also authorizes and pays for services to children who are uninsured, who have high medical costs and meet program income eligibility standards, or who have commercial insurance that has specific service limits that CCS can supplement, these populations of children were not discussed.

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hypothesized that referral volume would increase after the carve-out. It also was expected that more referrals of children with "borderline" CCS eligibility would be made, and/or that service authorization requests for children already known to CCS would include more services with "borderline" relevance to the CCS eligible diagnosis in the carve-out period relative to the pre carve-out period. Finally, the significant organizational and role changes involved with implementing the carve-out may have led to different experiences across the counties with respect to the early days of implementation. Contextual factors within different counties may have contributed to more immediate observed effects in some counties and delayed effects in other counties. The discussion of the CCS referral process focused on (1) the volume of referrals; (2) the types of referrals made (i.e., the distribution of diagnoses among new referrals; the distribution of diagnoses or service types related to new service authorization requests); (3) the timing (relative to the carve-out effective date) of any perceived changes in referral patterns; and (4) the likelihood of a given referral resulting in a identification of a CCS-eligible child (versus a finding of ineligibility) during the pre and post carve-out periods.

Volume of referrals

CCS administrators were asked about their perceptions of service authorization in the post carve-out period. They were asked about specific types of situations (if any) that might contribute to increased referrals and "cost-shifting" to CCS, and what was causing those effects.

CCS staff in four of the five expansion counties reported having observed an increase in referrals to their CCS program after the carve-out. In each of the four counties, the administrators attributed the increase in referrals to the carve-out. The exception was Los Angeles County, where staff reported that they had not observed an increase in referrals after the managed care expansion and carve-out were implemented. However, an administrator noted that an increase in CCS referrals had been observed beginning around early 1999 and did attribute this increase—albeit delayed—to the carve-out incentives.

Administrators in counties with both a mandatory managed care group and a non-mandatory group were asked about the impact of the carve-out for each group. In the COHS counties (including Orange), nearly all Medi-Cal beneficiaries are in the mandatory managed care group. These beneficiaries receive all CCS services under the carve-out arrangement. In Two Plan counties, however, there is a sizable group of non-mandatory Medi-Cal beneficiaries who continue to receive fully fee-for-service CCS-related and non-CCS related Medi-Cal services after the carve-out. Administrators in the Two Plan counties were asked whether the referral changes appeared to be occurring only for those children enrolled in managed care plans under the carve-out, or whether the changes that were attributed to the carve-out seemed to be countywide changes that applied to all child Medi-Cal beneficiaries. Results from the interviews indicated that the carve-out effect extended to *all* child Medi-Cal beneficiaries, whether or not they were participating in managed care. In two of the three Two Plan counties where increased referral was noted (Los Angeles having been the exception), CCS staff interviewed felt that providers were referring more children who were in mandatory managed care aid codes to CCS, as well as more children who were in _non_-mandatory

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Medi-Cal aid codes. A staff member in one of these two expansion counties noted that when the carve-out began, providers began to refer more potential eligibles in their patient populations to CCS, in general. This includes children in Medi-Cal managed care as well as children receiving fee-for-service Medi-Cal. For the other Two Plan county, the administrator pointed to Medi-Cal field office changes rather than to provider behavior changes as the primary mechanism for changes to referral volume.

As discussed earlier, the carve-out created a financial incentive for referral of children within health plans. This incentive associated with prepaid capitation does not extend to children in fee-for-service Medi-Cal. Results from the interviews indicate that the primary mechanisms for a carve-out effect on referrals are not limited to individual provider decision-making about the costs and benefits of making a CCS referral. Instead, these mechanisms include the following: (1) changes in the referral practices of providers; (2) referrals from health plans, and (3) Medi-Cal field office protocol changes.

One staff member observed that some providers who would never have referred in the past are now making referrals not because the child is expected to be CCS eligible but for fear that otherwise they may not get reimbursed for services provided. According to this staff member, referrals now are received for children for whom financial and insurance screening has not been completed, for example. In such cases, the provider may feel that a denial from CCS will be helpful if they need to seek authorization from Medi-Cal, or that if the child's commercial insurance does not come through, that the state-only (non-Medi-Cal) CCS program may be a payment option. Several administrators observed that in some ways, the education they had performed about CCS for the provider community was being rewarded. In some cases, this level of post carve-out education was only made possible by extra Medi-Cal funds provided to the county CCS program due to the managed care expansion.

Other interviewed staff pointed to health plans as an important source of referrals. The staff stated that the health plans received authorization requests from providers that the health plans subsequently deferred to CCS when a CCS eligible diagnosis might be involved. According to a CCS staff member in one expansion county, the combination of prepaid health plan sensitivity to potential CCS eligible diagnoses, and past circumvention of CCS (which had suppressed the volume of CCS participants in the pre carve-out period) was resulting in the increased referral rate.

A staff member in one expansion county reported that while there was generally greater awareness of CCS since the carve-out, the significant mechanism by which referrals to CCS had expanded was through deferred Treatment Authorization Requests (TARs) from the Medi-Cal field office. This staff member felt that the Medi-Cal field office had become more aware of potential CCS eligibility. The field office appeared to be more likely to defer a service authorization request to CCS if it was considered to be potentially CCS eligible. One staff member who noted the impact of field office changes specifically pointed to orthopedic cases and to hospital admissions for young adults as types of requests to Medi-Cal (under fee-for-service) that in the past would not have been deferred to CCS for consideration. Because FFS is not accessible (except for carved-out CCS services) for

those participating in managed care, the Medi-Cal field office activities would affect children who are in the *non-mandatory* group, and the smaller number of children in the mandatory group who are not yet enrolled in a health plan. At least one administrator in each of the four counties that maintain fee-for-service Medi-Cal systems stated that Medi-Cal field office deferrals were an important contributing factor to the carve-out effect.

A staff member in one expansion county stated that in some counties, the CCS program was receiving up to four or five different referrals for the same child. This is due to incoming referrals from the health plan, hospital, physician primary care provider (PCP), specialist, and even the family. While multiple individuals taking on the responsibility does ensure that the child is referred to CCS, it can produce a major clerical workload for the CCS program. The impact of increased referrals on CCS programs was also emphasized by the state CMS administrator. Without adequate CCS staffing, the increased referral volume (particularly with the added volume of ineligible children) can slow down the referral and authorization system.

Timing of observed changes in referral patterns

When asked about the timing of any carve-out impact, administrators in three of the five counties stated that the effect was not immediate. One administrator estimated that approximately six months elapsed (after the carve-out effective date) before the CCS program started to observe a significant effect in terms of referral activity. In Los Angeles, approximately one year elapsed between the initiation of the default managed care enrollment process and the significant reported increase in referrals. In the remaining two counties, the CCS staff were not able to identify the time frame of the effect. In one of these two counties, the CCS administrator felt that the effect had not been immediate but was unable to identify the specific time frame.

One unique aspect of carve-out implementation was noted for the Orange COHS. Initially, CalOptima had up to 30 managed care subcontracts. Each of these early participating prepaid health plans had small numbers of children with CCS eligible medical diagnoses. According to one administrator, the fact that children with CCS eligible conditions were not a sizable part of any one health plan's enrolled Medi-Cal beneficiary population created an educational challenge for the CCS program in terms of CCS liaison and referral activities.

One CCS administrator in an expansion county noted that when the carve-out began, one health plan stood out in terms of being fully prepared for the carve-out. This health plan apparently searched their enrolled beneficiary population for children with CCS diagnoses or potentially eligible diagnoses, and was able to provide CCS with a list of these children soon after the carve-out became effective. The administrator did not know why this particular health plan differed from the other plans but speculated that it might be due to special awareness of CCS on the part of the health plan's chief administrative staff.

According to a staff member in one expansion county, in the early days of the carve-out, the health plans seemed to be deferring a larger volume of requests for potentially CCS eligible children to

CCS, and also seemed to be encouraging the primary care providers to refer to CCS. In contrast, as the carve-out implementation progressed, it appeared that the health plans were allowing primary care providers (PCPs) to send a child to a specialist (at least for the first visit, if not subsequent visits) without getting special authorization first from the plan. Thus children have more ready access to the first specialty visit. This staff member felt that as a consequence, the rate of referrals from PCPs to CCS may have declined relative to the initial increase in the rate following carve-out implementation.

The state CMS administrator reported that referral increases had occurred in some of the non-expansion counties as well. The time frame for this general increase was estimated as beginning in 1997 to 1998. It appears that there is now a significant increase in referrals and caseload for these counties. According to the administrator, this may be due to the fact that Medi-Cal field offices cover not only expansion counties but also non-expansion counties. Thus to the extent that policies and procedures relating to potentially CCS-eligible children undergo any changes, they are likely to have an effect on all counties within the field office service area and not only the counties implementing the carve-out policy.

Changes in types of referrals

The CCS administrators who had observed a post carve-out increase in referrals were asked what types of diagnoses (for newly referred children) and what types of service requests (for newly referred children and children already known to CCS) comprised the increase.

In one county, the administrator stated that the volume had not been sufficient to assess trends with any confidence. In all of the other counties, the CCS administrators pointed to diagnosis services as a major category of increased service requests. According to a staff member in one expansion county, prior to the carve-out virtually all diagnostic evaluations were reimbursed by Medi-Cal. CCS did not receive a referral unless the service could not be reimbursed without a TAR, and reimbursement for laboratory work-ups generally was not restricted to the TAR process. Thus if a child ultimately was referred to CCS for heart murmur or for growth hormone for example, the diagnostic evaluation would generally have been completed using Medi-Cal dollars with no involvement from CCS. The staff member noted that because these fee-for-service costs had been used to create the current capitation rates for health plans, the perception in the CCS program was that the plans were already receiving funds under the capitation to provide extensive diagnostic evaluations. However, the plans have pointed to the CCS eligibility manual. The manual states that CCS can authorize diagnostic evaluations (even though in the past, CCS was generally not asked to authorize these evaluations). Consequently the CCS program is working out what they will need before establishing that there is enough of a suspicion of a CCS eligible condition to allow CCS to pay for the rest of the diagnostic evaluation. As one staff member explained it, the ambiguity stems from the fact that CCS is a medical program but not a screening program.

According to one administrator, the issue of who authorizes and pays for certain diagnostic evaluations under the CCS carve-out can negatively affect children. A PCP often will refer a child to

a specialist after recognizing a potential problem. The plan then refers the child to CCS, but there is no report provided to CCS other than the fact that the referral and appointment have been made. The PCPs are not writing reports for the specialists that detail their findings. General pediatricians have not had a significant role in referring children to CCS. For example, they often do not have an automated process for generating a detailed report (although handwritten notes are acceptable for a CCS referral), and moreover, pediatricians are not adequately reimbursed to cover their time in making the reports. According to the staff member, this can put CCS in the position of reviewing medical eligibility for a "rule-out" type of service request. If CCS waited for a report from the PCP pediatrician that adequately established the suspicion, all of the children could experience delays in getting to their first specialty appointments. Alternatively, if the health plan would authorize the specialist visit, CCS could easily make a determination of eligibility based on the specialist's report. The problem with payment then arises only for the cases where the exam produced a normal finding.

When asked whether particular diagnosis categories were associated with increased referrals of children not previously known to CCS, one staff member in an expansion county noted that children who present with mixed neurological or orthopedic problems with no clear cause would constitute one group. Because the history of CCS has been for orthopedics and neuromuscular problems, the administrator speculated that there may be more awareness of possible CCS eligibility for those types of conditions relative to others. Thus as awareness of the carve-out grew, physicians may have increased their referrals first for the types of medical diagnoses that they definitely knew to be CCS eligible.

The state CMS administrator reported that increased referrals were occurring for NICU stays and some surgeries due to the carve-out. Hospitals were a significant source of the increased volume. It was also noted that even in physician offices, it may be clerical staff that make the authorization request to the CCS program or Medi-Cal office. Thus multiple organizations and individuals within those organizations are involved in the referral process.

Likelihood of a referral being identified as CCS eligible

Staff also were asked whether there had been an increase in the proportion of referrals where CCS eligibility was close to the "borders" of CCS medical eligibility guidelines. According to a CCS staff member in one expansion county, there has been an increase in referrals to CCS of "borderline" medically eligible children since the carve-out was implemented. The staff member observed that the largest group of such borderline cases involves diagnostic services for a child who may have a CCS eligible diagnosis.

In general, the CCS staff who were interviewed reported that after the carve-out, there was a lower likelihood per incoming referral of the staff making a determination of eligibility that *affirmed* CCS eligibility. In general, staff attributed this to the referral volume and specifically to the increased volume of referrals that are less clearly CCS eligible. Overall, staff reported that a finding of eligibility appeared less likely (i.e., eligibility was less likely to be established) for referrals for

diagnostic services, or for treatment services for urinary tract infection (UTI), seizures, or pneumonia. Some staff also felt that referrals for small (but not the smallest) newborns were resulting in a finding of eligibility less frequently than had been the case in the pre carve-out period.

According to the CCS administrators interviewed, some of the diagnostic categories where referrals are received but often do not result in a finding of medical eligibility include the following: seizures; diabetes; children in neonatal intensive care units (NICUs) who initially met CCS eligibility but no longer meet the criteria; orthopedics; and hearing loss. Wheelchairs were identified as an example of a particular product or service.

If a higher volume of referrals following the carve-out is testing the boundaries of CCS medical eligibility criteria, then there may be more pressure relative to the pre carve-out period in terms of local interpretations of the State CMS medical eligibility criteria. To explore this possibility, CCS administrators were asked whether they felt they were now more likely to authorize care when significant discretion was involved, compared to the pre carve-out period. (The purpose was to distinguish between situations where the eligibility determination was straightforward and situations where the determination decision was not as straightforward). CCS staff also were asked how they would respond to a hypothetical situation where they are asked to authorize a service they believe is not CCS eligible or is the health plan's responsibility but that is a medically necessary service that is sensitive to a time delay. Staff were asked specifically whether they perceive there were increased authorizations by CCS due to concerns about timeliness of care, or due to the "gray areas" that exist in defining services required for a CCS eligible medical diagnosis and services that are not related directly to that diagnosis.

In one county, a staff member expressed the observation that CCS had sometimes "stretched" in terms of eligibility criteria (i.e., in situations where the discretion allowed in the medical eligibility guidelines made it possible). The staff member felt that this did not represent a change in eligibility criteria applied to referrals. Instead, it represented an increased tendency to affirm eligibility in a somewhat nebulous or "gray" area of medical eligibility. A CCS staff member in another county reported that there had been an initial "benevolence" when the carve-out took effect with respect to CCS paneling requirements. This was not a question of whether the child was eligible but a question of whether the provider met paneling requirements for authorization.

CCS administrators also were asked whether they had observed changes in the quality of information available on the average referral. According to a staff member in one expansion county, it was not clear whether the amount of information (particularly medical information) that is provided on the average CCS referral has changed relative to the pre carve-out period. The staff member noted that on one hand, there tends to be less volume of information with a referral—particularly fewer ancillary notes because physicians used to supply copied medical notes along with referrals. On the other hand, the staff member noted that the Local Initiative has a standard form that is submitted to CCS as a referral. Having a standard form can trigger whoever completes the form to provide information in the way of check-boxes (for example). Thus CCS tends to receive several lines of summary information from the physician within the scope of the

form rather than receiving the actual test results or narrative about the results. Staff members in two counties reported that while the medical information that CCS now receives with a referral is more condensed that in the past, the information does tend to be more specific and directed toward the service authorization request and the rationale for the request.

The state CMS administrator noted that some plans and providers appear to be referring a large volume of children who are unlikely to be found CCS eligible. Although changing referral practices may have increased referral of children who ultimately are found not to have a CCS eligible medical diagnoses, some of the administrators noted that there are positive aspects to such referrals. According to one staff member, the capabilities of CCS nurses are such that a child's quality of care is enhanced by a referral to CCS; CCS nurses help direct people to appropriate sources of care and with other needs. One staff member observed that CCS nurses in the county's program often take the opportunity with a referral to share information about resources in the community that may be helpful for the child and family even if the referral does not result in a finding of CCS eligibility. The state CMS administrator also noted the potential benefit of "over-referral" with respect to identifying all eligible children, if CCS programs were adequately staffed to handle the volume.

"Circumvention" of CCS Authorization Under Fee-for-Service Medi-Cal

As described in Chapter 2, in fee-for-service Medi-Cal not all services that are Medi-Cal benefits must be pre-authorized. Further, of those that must be pre-authorized, the local Medi-Cal field office as well as the CCS program are potential authorization agents. Although the interagency agreement between Medi-Cal and CCS states that CCS will evaluate authorization requests (TARs) that involve a CCS eligible medical diagnosis, the distinction involves some ambiguity. CCS administrators were asked to evaluate the extent to which CCS became involved in evaluating such requests, and to extent to which CCS consideration of such requests was "circumvented". This could occur through the claim being sent to and paid directly by the Medi-Cal fiscal intermediary, or through the authorization request being made to the Medi-Cal field office and not deferred to CCS for consideration. This question was posed to CCS administrators to gauge the relative effects of the incentive changes and the possible Medi-Cal field office changes for the post carve-out referral increase.

CCS staff in all of the expansion counties reported that there had been significant past circumvention of the CCS authorization process. In general, the interviewed administrators stated that they had always known that there was some circumvention but that they could not quantify it. When asked about the reasons for circumvention, staff identified apparent changes to Medi-Cal field office protocols, and to referral practices on the part of providers.

In two of the three Two Plan Model counties, some or all of the CCS staff who were interviewed stated that they had observed changes in CCS referral practices on the part of the local Medi-Cal field office. Specifically, these CCS staff reported that after the carve-out, the Medi-Cal field offices were deferring more requests to CCS for authorization than they had deferred in the past.

According to a CCS staff member in one of the expansion counties, the volume of referrals is now higher than it has ever been. The staff member reported that in the past—including the pre-carve-out period—Medi-Cal generally would cover any service that was a Medi-Cal benefit and did not require a Treatment Authorization Request (TAR). The staff member also felt that services for CCS diagnoses that did require TARs were submitted directly to Medi-Cal and in some cases were approved by Medi-Cal. Thus a family, hospital, or physician could "totally circumvent the CCS program" and have the service authorized and paid for without CCS involvement. This was reported to no longer be the case. Instead, Medi-Cal field offices appear to be informing providers who submit TARs for CCS-eligible services that the request is being deferred to CCS. Thus CCS is receiving deferred TARs from Medi-Cal that in the past would have been approved by Medi-Cal. According to the staff member, the Medi-Cal system has improved in terms of getting CCS involved in the authorization process. While this has largely occurred since the carve-out became effective, it has not strictly been a result of the managed care expansion and CCS carve-out, according to the CCS administrators interviewed.

The staff member indicated that in the past, a pediatrician could provide certain diagnostic services, such as cardiac evaluation, EKG, intravenous pyelogram (IVP), ultrasound, or CT scans for example, without having to submit a TAR or at least without having to submit a TAR to CCS. With the managed care expansion, when a prepaid health plan receives a provider request to provide a basic kind of screening service or test, the health plan often tells the provider that if the purpose of the service or test is to rule out a medical diagnosis that is CCS eligible, then CCS has the responsibility for authorization. The referral then will be sent to CCS. According to this CCS staff member, the health plans are requiring the physicians to get approval for all of these types of services or tests. Once the plan receives the request and identifies the request as potentially CCS-related, the referral to CCS is made. Thus there is a certain volume of requests for services that now are being seen by CCS. While some of these services could have been authorized by CCS in the past, generally CCS did not become involved in the authorization process because the services could be provided without CCS involvement.

When asked what areas of CCS referral (in terms of specific populations of children, or particular types of services) seemed most affected by past circumvention of CCS authorization, the staff interviewed focused in several areas. These areas included incidents of violent trauma in young adults; orthopedics; and NICU episodes.

A staff member in one expansion county noted that the types of situations in which CCS would have been circumvented prior to the carve-out probably did not involve many children with serious conditions. The staff member felt that these situations generally involved children and especially young adults who are being seen or hospitalized by providers who were not usual pediatric providers and not familiar with CCS. This includes hospitals that were not usual providers for CCS. Even though the hospital(s) might be CCS-paneled for a 14 years of age and over population, they weren't used to referring to CCS. In the past, these hospitals were sending requests for hospitalizations and outpatient services on TARs to the Medi-Cal field office and were receiving authorization. According to the staff member, CCS involvement has been an important issue for the

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young adult population. Most Centers and providers who are seeing complex children tend to be geared to younger children, and CCS specialty centers may not want to start with a 20 year old. According to this staff member, prior to increased awareness by the Medi-Cal field office, those sorts of requests for authorization would not get to CCS.

A staff member in one expansion county raised trauma as an important area because the main trauma hospital in the county is not CCS paneled. In the past, intentional (violent) injuries treated at this hospital would trigger requests to the Medi-Cal field office rather than to CCS. Now, with awareness from the plans that something may be CCS eligible, the providers for these children are feeling the impact. For children in Medi-Cal health plans, the plan will not authorize services that CCS will cover. Thus care for the child will need to be provided within standards established by CCS. For example, a surgeon for a young adult might prefer not to transfer the individual to a paneled facility, yet this would be a requirement for CCS reimbursement. Physicians also may feel they are being asked to transfer children earlier than they would like. According to the CCS administrator, this often means that the individual will need to go out of the county to receive care in a paneled facility. Although it means that the individual receives care according to CCS standards of provider paneling, it can create problems for the young adult and the family.

According to an administrator in one expansion county, some of the circumvention of CCS prior to the carve-out was of a different nature. According to this administrator, prior to the carve-out, in some cases physicians would not refer a child to CCS (either for a particular service for a child known to CCS, or for a child who had never been referred to CCS) before the service was provided. The provider would then request authorization for the service that already had been provided. Because in most cases CCS operates under pre-authorization policies and procedures—exceptions being emergencies and (pre-approved) standing authorizations in particular instances—CCS would deny authorization. Then the physician would file a fee-for-service Medi-Cal claim and would be paid. In this situation, the CCS authorization process would be circumvented but not because the child was never referred to CCS.

An administrator interviewed in one expansion county noted that some providers have problems with billing that result in aged claims or in late tracking of submitted claims. Consequently the CCS staff member noted that such providers may not have realized until more recently that the claims are coming back unpaid.

According to the state CMS administrator, circumvention had been an issue for CCS statewide prior to the expansion. Some of the Medi-Cal field offices are responsible not only for an expansion county but for outlying non-expansion counties. Consequently it would not be surprising that changes to field office policies and procedures with respect to potentially CCS eligible children that are attributed to the carve-out could also have an impact on non-expansion counties. Discussion between State CMS and Medi-Cal program staff about authorization policies and procedures did take place prior to carve-out implementation.

The state CMS administrator also reported that the large increase in CCS referrals was partly attributable to the retroactive eligibility policy. Because CCS generally does not authorize services that were provider prior to the child's date of referral to CCS, the referral is generated by a provider or a health plan if there is any chance of eligibility. Because CCS is a case management program that is designed not only to provide medical case management but to ensure that the child is directed to an appropriately trained provider, retroactive eligibility would undermine these core functions. While referral to CCS has payment implications for the provider or health plan, the CCS program focuses on the case management function and the fact that the care of children has not always been well-managed when CCS is "circumvented".

Differences by Health Plan Type in Two Plan Counties

It is possible that a county CCS program has different operating relationships with the Local Initiative health plan and with the Commercial Plan. If there are operational differences, this may have an impact on referrals, on CCS program participation, and on expenditures within the county. CCS administrators in the Two Plan counties were asked whether there were operational differences and if so, why these differences were present and whether the differences had any impact on referrals or authorizations.

CCS administrators in several counties noted that there were differences in organizational culture as well as in the formal relationship with CCS, between the Local Initiative and the Commercial Plan. For the most part, the administrators reported that these differences resulted in different operational arrangements—such as more formality in communications, and more regular (but less frequent) information exchange. The CCS administrators also stated that these organizational differences affected CCS referrals and service authorizations in only a few ways.

In three of the four Two Plan counties, the interviewed staff members reported that on average, the commercial plans seemed less likely than the Local Initiative plan to authorize service when the eligibility of the child was under CCS review. However, several staff members noted that a recent Commercial Plan change to allow one specialist referral without authorization might address this issue.

In one county, a staff member who was interviewed made the observation that because the commercial plans participating in Medi-Cal are statewide health plans, they may have difficulty negotiating county-specific policies and procedures with respect to authorization. Because the Local Initiative plans each operate in only one county, they potentially have greater flexibility for adopting policies and procedures in response to the carve-out effects. According to the state CMS administrator, at least one commercial plan that operates in multiple expansion counties has brought possible differences in local eligibility criteria to the attention of the central office. These plans operate in multiple counties and thus are able to identify such differences.

One CCS staff member in a Two Plan county noted that the Commercial Plan will not authorize or pay for services that are considered by the health plan to be related to a CCS eligible medical

diagnosis. The staff member perceived that as a result, providers in the county were learning to make the referrals directly to CCS. In contrast, the Local Initiative plan has policies and procedures in place to authorize provision of the care if the referral is submitted to the health plan prior to being submitted to CCS. If this occurs, then the plan will authorize the care pending the eligibility decision by CCS. The staff member reported that as a result of this policy, the providers learn to first request authorization from the health plan (for children under their care who are enrolled in the Local Initiative). While CCS is making the eligibility determination based on available medical information, the health plan will allow the provider to deliver the service(s). The issue of what entity ultimately pays for the care can thus be settled after the fact.

Other organizational characteristics of the health plan were raised by several administrators as relevant to carve-out impact. A staff member in one expansion county noted that the carve-out posed challenges to a staff model health plan. Providers in the staff model have difficulty with sending a child out of the system, and yet this may be necessary due to CCS paneling requirements. Not only is such a health plan not set up for fee-for-service billing, but also the physicians are oriented toward provision of care but not the financial aspects. For example, they are used to sending a patient to another provider in the building without going through an authorization process. Thus it has been difficult for their physicians to see the advantage of children under their care having the care transferred to another facility, particularly when these services have been provided within the staff model plan for some time. One staff member noted that it has been an important mission within the staff model health plan to integrate Medi-Cal beneficiaries into their system of care for the commercially insured population. However, the plan now has to treat child Medi-Cal beneficiaries differently because of the CCS carve-out. The plan is not able to offer families the "one-stop-shopping" that families may have been looking for when they enrolled in the health plan. In summary, the difficulties involve in operating under the carve-out may contribute to some CCS authorizable services being provided within the plan without reimbursement from CCS.

Several interviewed staff members pointed to some advantages of the transition to health plans and a CCS carve-out for child Medi-Cal beneficiaries. One administrator provided an example of how flexibility in a health plan can facilitate access. This administrator described an arrangement that had been worked out within the county to solve a problem relating to which entity (the Local Initiative or the CCS program) would be the payer for a particular diagnosis. The Local Initiative was able to work out a viable agreement with CCS on payment for diagnostic evaluations for heart murmurs. The Local Initiative authorized care pending a CCS authorization. Once results were available, CCS paid for evaluations when the evaluation identified a CCS eligible diagnosis, and the Local Initiative paid for evaluations when a problem was ruled out. This had been an area of contention with the health plans. The Local Initiative in this county is one of California's Local Initiative plans based in the county's public health department. It was the observation of this staff member that both CCS and the Local Initiative were able to find a workable compromise that would promote access to care, in part because of their co-location within the public health department and their shared public health perspective.

One administrator indicated that State CMS has been concerned about placing authorization limits on diagnostic services based on the evaluation outcome. The administrator felt that the arrangement between CCS and the health plan has been workable and perceived as fair on both sides.

The state CMS administrator reported that some plans appeared to be referring children who clearly did not have CCS eligible medical diagnoses, while others generally were more selective in referring children who were likely to meet medical eligibility.

Changes in CCS Paneled Providers

It is possible that carving-out CCS services from the managed care expansion has affected the proclivity of providers to become CCS paneled. Because CCS is generally limited to authorizing services that are delivered by paneled providers, fee-for-service Medi-Cal services for the mandatory enrollment group becomes largely limited to CCS paneled providers. If some combination of Medi-Cal field office deferral patterns and CCS authorization practices increases the enforcement of CCS paneling, this strengthens the existing incentive for physicians, hospitals, and ancillary providers to obtain CCS paneled status so that they can participate in fee-for-service Medi-Cal for CCS eligible children. To evaluate this aspect of carve-out impact, CCS administrators were asked about changes in interest in the CCS paneling process, and about changes in paneling status within the local provider community in the post carve-out period.

While CCS paneling is a State CMS function and not a county function, several administrators had observations about CCS paneling trends in their counties. Staff interviewed in three of the five expansion counties stated that they had observed increasing physician participation in CCS. They reported a general increase in the volume of providers who were paneled by CCS since the carve-out.

A CCS staff member in one expansion county reported that there are now more paneled specialists as well as more paneled primary care physicians in the county. According to this staff member, the increase in paneling has a direct connection to the expansion of Medi-Cal managed care. If a child enters a hospital with a non-paneled physician, the physician is not going to be paid by CCS, and / the health plan will identify the care as related to CCS and also will not pay the provider. Consequently the staff member felt that there is a strong incentive to get numerous specialists to become CCS-paneled. To become paneled, the physician only needs to submit specific training certifications to State CMS. In terms of specific specialties, the staff member pointed to orthopedics and cardiology. The staff member also noted that primary care providers (PCPs) also are responding to the requirements of the new system. Because the PCPs are responsible for managing the child's care and for new referrals to CCS, the PCPs are quickly learning about CCS and the referral process.

The staff member further noted that since the carve-out, the understanding has spread in the provider community that a child must receive care within a paneled hospital and services from a paneled provider. Initially the health plans appeared to this staff member to be more "forgiving" of

services that were provided where a CCS referral should have been made. The health plans now seemed to take the position that providers should know the rules and were no longer forgiving (i.e., would not pay for the care if a CCS referral should have been made). While the CCS program did not directly observe this process, it appeared to the staff member that in the early days of the carve-out, admissions to non-paneled hospitals and with non-paneled physicians (on non-timely requests) sometimes took place. In some cases, the Local Initiative plan was known to pay for some of those admissions. In contrast, what is being heard from the community now is that if a child is admitted to such a non-paneled facilities, the hospital is highly motivated to move the child from the facility if it is not an emergency situation and the child can be transported. This is because they know that the health plan will not cover those services, and the hospital is at financial risk. A staff member in one expansion county characterized physicians and hospitals as "panicking" and trying to get CCS to make a medical eligibility determination as quickly as possible in case the child is not eligible. According to one staff member in an expansion county, the increase in paneling has extended to ancillary (e.g., non-physician, non-hospital) providers.

One administrator noted that the CCS program has encouraged physicians in the community to become paneled and specifically has visited hospitals to encourage surgeons (such as those who are following young adults, in particular) to become CCS paneled so that CCS can authorize care that these physicians provide. An administrator in one county noted that managed care in the commercial non-Medi-Cal sector had brought about changes in specialty referral practices that were affecting the pool of available specialists within the county. The special criteria that apply to those providing services through the CCS program, such as the paneling requirements and access to specific specialists and subspecialists, are not requirements in the private, commercial sector. This administrator reported that neurology and endocrinology were examples of specialties where the number of available specialists appeared to be declining. The administrator also speculated that carving out CCS services from Medi-Cal managed care may have helped to retain some of these specialists.

The administrators interviewed generally stated that while there had appeared to be more interest on the part of hospitals in the CCS paneling process, there had not been any change in actual paneling since the carve-out/managed care expansion. They noted that hospital paneling is very involved and is not only a major undertaking but a slow process. In one county, the CCS administrator who was interviewed noted that the county had lost its single paneled hospital in the past few years. This was attributed by the interviewed administrator as stemming from low California Medical Assistance Commission (CMAC) rates[84] rather than stemming from CCS policies or from the managed care expansion.

According to one staff member, the managed care expansion has made it easier to get medical information about a potentially CCS eligible child. The staff member felt that there are more providers now involved in providing care to child Medi-Cal beneficiaries and also that the providers

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[84] Hospital rates for the Medi-Cal program are negotiated by CMAC; rates for other providers are determined by Medi-Cal.

understand that they need to get the necessary information to CCS to get the necessary care for their patient. The staff member did not know whether there were more PCPs participating in Medi-Cal or whether CCS had just not had contact with these PCPs prior to the managed care expansion.

The state CMS administrator reported that there had been a large volume of providers requesting paneling status. While state CMS does maintain records of paneled provider volume, these records are maintained as manual lists and further do not contain information on the providers' activity with respect to the CCS program. Not only may some providers no longer be providing services to CCS eligible children, but also some providers may greatly restrict the number of child Medi-Cal beneficiaries in their practices. Thus it has been difficult for CMS to rely on paneled provider lists to capture volume of participating, paneled providers.

Response of Families

The Medi-Cal Managed Care Division permits Medi-Cal beneficiaries to request exemptions from mandatory managed care participation if there is medical need (i.e., if enrollment would disrupt continuity of their medical care). If parents of children with CCS eligible medical diagnoses are exercising this option, then the proportion of children in the mandatory group who actually are directly exposed to the carve-out incentives is further reduced in the county. Also, some children with CCS eligible medical diagnoses who are in a mandatory managed care aid category (e.g., cash assistance; non cash assistance low-income family) may also qualify for Medi-Cal under an aid category that is in the non-managed care requirement group (e.g., medically needy) in the county. If such switches occur within a county, then volume of CCS claimants may increase in the non-mandatory group and decline proportionately in the mandatory group. CCS administrators were asked whether they knew of families requesting such exemptions and whether they were aware of attempts to change aid eligibility categories to avoid the managed care requirement.

None of the staff interviewed in the five expansion counties stated that they knew of efforts by families to "switch" the child's aid category so that the child would move from a mandatory participation group to an aid category that was not associated with mandatory managed care participation. In addition, none of the staff in the five expansion counties stated that medical exemption attempts had been a significant issue for families referred to CCS. One administrator in an expansion county noted that families receive health plan disenrollment forms with all of their other Medi-Cal enrollment information and may not be aware of provisions for disenrollment and/or for medical exemption, or may not complete it even if they understand its provisions.

In several counties, the staff interviewed noted that initially there had been some problems with families being defaulting into managed care or into a plan that would not have been their choice. They also noted that there had been a fair amount of initial default problems and also plan-switching (disenrollment) during the early days of implementation. That is, when the mandatory expansion first took effect, a number of families switched health plans and in some cases several times during the year. The staff who raised this phenomenon also noted that it appeared to be self-limited and that families generally stayed with a health plan once it was selected.

A staff member in one county was aware of some children receiving SSI who disenrolled from prepaid health plans but not of requests for exemptions among children from the mandatory managed care group. The staff member did note that there was a significant amount of plan-switching in the first year but that the effect had significantly diminished over time.

Frequency and Handling of Different Views on CCS Coverage Limits

As the payers of Medi-Cal services for health plan participants, the health plans and the CCS program may be the most likely organizations to have differing perspectives on what is CCS eligible and what does not meet CCS eligibility guidelines. If such differences occur, it may have marginal effects on what CCS does and does not authorize. Further, there might be some variation by county in these perspectives, based on the specific Medi-Cal contracted prepaid health plan(s) in the county and/or the interactions between the prepaid health plan(s) and the specific county CCS program.

CCS administrators were asked how frequently disputes with health plans and/or providers occur about CCS coverage and how those disputes are resolved when they occur. In three of the five expansion counties, one or more staff members interviewed expressed the observation that the County CCS program had moved away from what was initially a somewhat "adversarial" relationship between the CCS program and one or more of the health plans. Only one of these three counties noted that there continued to be concern on the part of one or more of the health plans that the CCS program was denying some cases where the health plan felt that the child was eligible or that the service should be authorized by CCS.[85]

One administrator attributed the lack of disagreements to: (1) a good relationship between CCS and the prepaid health plans; (2) dialogue between CCS and the plans, with the ability of plans to question CCS decisions; and (3) the option (which has always existed) of seeking input from the local medical consultant and from the State CMS California Regional Office. Several administrators noted that while infrequent, disagreements about CCS coverage limits that are sent to a regional CMS office for review can result in useful clarifications on eligibility.

An administrator in one county pointed to diagnostic services as an area where there are not necessarily disputes, but where the decision-making process can be somewhat prolonged. Having a CCS nurse based at one hospital has been helpful because the nurse is able to look at the medical

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[85] According to a staff member in one expansion county, the pre and post carve-out difference in dispute issues is related not to the dispute itself but to who disputes or questions the decision. In the past, if CCS denied a referral from a physician, the physician would generally call directly and receive the explanation from CCS. In some cases, this would result in additional information being conveyed to CCS. Sometimes the authorization decision would change based on the new information that was provided. After the carve-out took effect, providers and families appeared to communicate directly with the health plan instead.

record and identify in some cases more information that what had been submitted to the health plan, which allows CCS to make the medical eligibility determination.

In those counties that had pre-carve-out "CCS-include" PHP contracts, no relationships between CCS and these contracting PHPs around the CCS population (e.g., referrals to CCS of children identified within PHPs, etc.) were identified. Staff stated that they had little or no contact with these PHPs about children enrolled in the PHP, with the exception of children involved with the State-only, non-Medi-Cal part of the CCS program.

According to the state CMS administrator, the managed care expansion and carve-out have made differences in medical eligibility decision patterns across counties more clear. It has caused CCS programs to become more uniform in interpreting medical eligibility particularly in the "gray areas" of eligibility.

Other Effects of the Managed Care Expansion and Carve-out

Relationship between CCS and health plans   CCS administrators were asked about the relationships that have developed between the CCS agency and the prepaid health plan(s) in the county. Several administrators pointed to aspects of these relationships outside of the basic referral process described earlier. According to a staff member in one expansion county, the health plans have often been helpful in the area of eligibility determination with respect to providers who are not CCS paneled. Providers who are CCS-paneled can share medical information with CCS; however, primary care providers who are not paneled are less likely to want to send information to CCS. According to this staff member, the plans have been very helpful in explaining to such PCPs what specific information CCS requires.

Importance of health plans' specialty care reimbursement rates   One CCS administrator raised another potential effect of the carve-out. This administrator noted that Medi-Cal capitation rates do not encourage referral to specialists and that rates for specialists are low just as PCP rates are. This provides a disincentive for referral (or at least a disincentive for seeing the children). Moreover, there could now be a financial disincentive for referral to CCS. The CCS administrator noted that at least three Local Initiatives pay more to physicians than Medi-Cal would pay under fee-for-service. Thus for a case that is handled under the carve-out, a specialist could actually be paid less under the carve-out FFS payment than would be received if compensated under the managed care system. This is because the health plans are paying the specialist more for a visit than the Medi-Cal rate for that visit (which is what is paid under CCS authorization). While the payment to specialists depends on whether the capitation or contract fee-for-service payments are used, it is conceivable that physicians could respond to the incentive. The administrator did not speculate as to whether such an incentive had affected physician referral practices or know of any anecdotal information that indicated such a response had taken place.

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Other CCS Program Changes During the Study Period

Administrators were asked about factors that may affect CCS case finding and total costs for Medicaid child beneficiaries in their counties, during the study period. Such factors might include statewide or local policies unrelated to the carve-out, changes in the local population, and staffing changes. While statewide changes to the Medi-Cal and CCS programs during the period 1994 to 1997 may have identical impact across counties, the implementation of some changes (such as the expansion of reimbursable EPSDT services and case management services within Medi-Cal) may have some local variation.

Five day timeframe for CCS eligibility determinations One staff member noted that Children's Medical Services adopted a policy of committing itself to determining medical eligibility within 5 days of referral. This was reported as a substantive change in departmental policy that was stimulated by the carve-out policy.

Medi-Cal benefits authorized by CCS Specific changes to CCS or Medi-Cal benefits include infant RSV. According to a staff member in one expansion county, another area is in pharmaceuticals. The staff member reported that the State recently clarified that prior approval is not needed for pharmaceuticals. In this particular county, the Local Initiative plan (less so the Commercial Plan) has realized that CCS covers medicines for these children; the CCS administrator noted that this has caused a substantial increase in requests for pharmaceuticals. At the beginning of the carve-out, plans apparently had not caught on that pharmaceuticals and durable medical equipment (DME) also were CCS eligible. The staff member also indicated that regulations have changed for hearing-related services. CCS now covers services if there is documented hearing loss, and batteries now are a Medi-Cal benefit based on EPSDT regulations. Another change reported by the staff member focuses on in-home services. The current process is that In Home Operations (State Medi-Cal) assesses the service needs, and CCS authorizes the services. This was reported by one administrator to have involved a large increase.

Use of enhanced capitation payments for persons with disabilities Health plans in several expansion counties have implemented enhanced capitation rates for certain beneficiary groups with special health needs. While not discussed in detail, these enhanced capitation rates were raised by one or more interviewed administrators in the expansion counties. The Orange County COHS—CalOptima—implemented a differential payment rate for persons with disabilities (as identified by their Medi-Cal eligibility aid code) in October 1997. This new rate system enhanced the payment rates to specialists and to the primary care providers (PCPs) to whom individuals identified with disabilities are assigned.[86] The Alameda Alliance (local initiative plan) implemented

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[86] The enhanced CalOptima rates became effective in October 1997 and provided for payments to specialists that were 120 percent of the payment rate for individuals not identified with disabilities, and payments to primary care (capitated) providers that also were 120 percent of the regular capitation rate. The payment differential was increased to 130 percent in October 1999 (Medical Home Project Reimbursement Task Force minutes 1999).

a differential payment system for physicians based on the health risk of children for whom they serve as the assigned PCP. PCPs who complete health risk assessments for the children are eligible to receive enhanced rates based on the child's age and overall risk score (moderate or high needs).[87]

Continuing Issues of Carve-out Impact and CCS Roles under Medi-Cal Managed Care

Impact on CCS   A staff member in one expansion county pointed to some advantages of the Medi-Cal managed care transition for children receiving services through CCS. Because the health plans do not operate under the same constraints as the CCS program, they have the flexibility to do things such as contract with taxi companies to get their beneficiaries to appointments. Because CCS can only reimburse medical providers, CCS has to rely on the social services department of a hospital to give taxi vouchers to patients, and then have CCS reimburse the hospital. The Local Initiative in the county is willing to take on these costs even though CCS is unable to reimburse the Local Initiative for the costs. The administrator interviewed stated that the flexibility of the health plan, in combination with the health plan's willingness to provide services that are in the best interests of the child and family, has been an advantage of the managed care transition.

The state CMS administrator reported that the carve-out has caused CCS to become more uniform statewide in its interpretation and application of the medical eligibility criteria. While the state CMS conducted periodic program reviews of county CCS programs, it has been difficult for CMS to know about local differences in interpretation although such differences were suspected. While CMS does not have the capacity to conduct reviews that would identify all such differences, the introduction of commercial plans operating in multiple counties has moved the local programs to become more uniform. The commercial health plans are able to identify to CMS what specific differences appear to be operating across the different counties in which the commercial plans participate.

Importance of CCS role and emerging roles   All of the administrators interviewed generally described the CCS carve-out policy as a vital protection for the case management and authorization "product" that CCS provides. Several administrators stated that these CCS functions were increasing seen by the prepaid health plans in particular as a product with significant value. One administrator stated that in early discussions between the health plans and CCS about the memorandum of understanding (MOU) regarding carve-out operations, the health plans seemed to have unrealistic objectives about what the plans could potentially do for children with CCS conditions. This administrator indicated that as time had passed, the health plans appeared to have

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[87] As of 1999, the general PCP capitation rates were as follows: $28.32 per month (children 3 to 12 months); $18.42 per month (children 12 to 24 months); and $11.30 per month (children 2 to 21 years). Enhanced rates based on completion of the health assessment—which includes some specific CCS medical diagnoses as well as CCS program participation, but includes other needs as well—were as follows: $43.32 (moderate needs) and $58.32 (high needs) among the 3 to 12 month age group; $33.42 (moderate needs) and $48.42 (high needs) among the 12 to 24 month age group; and $26.30 (moderate needs) and $41.30 (high needs) among the 24 month to 21 years age group (Medical Home Project Reimbursement Task Force minutes 1999).

a better understanding of the value of CCS, and that this was another reason that the carve-out had been vital. An administrator in one county reported that CCS was increasingly being viewed as a case management rather than as a fiscal agency. This administrator felt that the CCS administrative case management role could eventually evolve into a role of quality assurance and oversight for children with special health care needs.

Sustainability of provider networks Several administrators emphasized the importance for the CCS beneficiary population of maintaining provider participation. An administrator in one county viewed the reported CCS "stretch" in authorization as important for provider sustainability. One staff member noted that there was a general concern in the county about reimbursement for the primary care physicians who are providing services to complex CCS children. A CCS administrator in another expansion county noted that there is a subset of such physicians who have taken care of the majority of children with complex conditions. Sometimes when these providers submit claims to the health plan, based on the ICD-9 coding on the claim the plan will refer to CCS. If there is a denial, the claim goes back to the plan. The administrator indicated that there may be more leniency now than in the past on the part of CCS to process and to authorize such a claim because this is a vital provider network for children with CCS medical diagnoses. The administrator observed that it does not serve the children well to have the physicians go through so much effort and never get paid for the services they are providing.

Data availability Few counties reported having better access to data or having new reports based on existing data. A staff member in one expansion county noted that the CCS program now produces monthly figures on volume of referrals, and produces monthly lists of diagnoses. One county reported having developed new data reporting out of its MOU with a local health plan. One CCS administrator noted that there were data availability constraints that limited the ability of the CCS program to educate the health plans and/or the provider networks with respect to CCS referral practices. According to this administrator, the CCS program does not receive the specific health plan information for a given child on the referral. While the program could conceivably extract this information from the automated Medi-Cal eligibility (MEDS) system, this would involve significant staff time. As a result, the CCS program is not able to look at total referral volume as a percent of beneficiaries within a given health plan. Education could be targeted to health plans as needed based on information such as the following: referral rates; rates of referral for children not found eligible for particular reasons; or other related trends. Finally, according to the state CMS administrator, statewide estimates of referral volume are not readily available because these data are gathered at the local level and because counties use different information systems and collect and report these figures differently.

The state CMS administrator noted that useful information about provider paneling status is important to the CCS program. Essential information includes not only local counts of paneled providers by specialty but also the local capacity with respect to the volume of children that the paneled providers will see. This was perceived to be particularly important due to current shortages

in pediatric subspecialists.[88] Without such information, it has been difficult for CMS to identify specific capacity constraints in the CCS provider network. Data are limited to the total volume of paneled providers.

Conclusions

The carve-out of CCS services from the Medi-Cal managed care expansions did more than providing physicians and hospitals with an incentive to shift costs to CCS wherever possible. The managed care expansions introduced prepaid health plans as a new participant in the identification and referral process. The health plans provided infrastructure for case-finding and referral in addition to having the financial incentive for referral, given their financial risk for certain specialty and inpatient services. The fact that several of these newly participating health plans are quasi-public organizations created as part of California's managed care expansion may also have helped to enhance CCS case-finding and referral functions within the health plan, consistent with their public health oriented missions.

Changing referral practices on the part of providers were identified as the primary factor. Other factors reported by some CCS administrators included practice changes by the local Medi-Cal field offices, and the new role of prepaid health plans in identifying and referring potential CCS eligibles. In some cases more leniency on the part of CCS staff in considering CCS eligibility was reported. It was reported to be difficult to separate the contribution of past CCS program circumvention from the unique effect of the "case-finding" incentive that the carve-out created. Increased visibility of the CCS program, greater recognition of the CCS role in case management, and preservation of an independent authorization process that was not subject to prepayment incentives were all reported to be positive outcomes of the carve-out policy.

Growing interest in CCS paneling status on the part of physicians as well as hospitals was identified. The carve-out was identified as important for sustaining involvement of subspecialists with the CCS beneficiary population. Some administrators raised concerns about the sustainability of local specialty provider networks given low Medi-Cal payment rates and given specialty referral practices in the commercial health care sector that are completely distinct from Medi-Cal and CCS payment policies.

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[88] A report developed by the Senate Office of Research in response to a California Legislature request includes local reports (from surveyed hospital groups, medical groups, and CCS special care centers) of subspecialty provider shortages (SOR 2000). The draft summary report cites data provided by the California Children's Hospital Association (CCHS) indicating that "average waits at special care centers and subspecialty clinics at three hospitals now last between a few days and several months, including up to two months in the case of craniofacial conditions, four months for diabetes/endocrine conditions, two months for nephrology, four months for neurology, three months for psychiatry, two months for pulmonary conditions, eight months for rehabilitative services, and two months for spina bifida (SOR 2000, p. 3).

CHAPTER 8—CONCLUSIONS AND POLICY IMPLICATIONS

California implemented a set of dramatic changes to the delivery of health care to Medicaid beneficiaries during the 1990's. Much of the policy debate over access to services focused on how to preserve specialty care access for children with complex medical diagnoses while also improving access to primary care to the general population. As California's ambitious plan to expand managed care unfolded in its largest counties, a legislative effort preserved the traditional role of the Title V California Children Services program in authorizing services under a case managed, fee-for-service system. This created new relationships between physicians, health plans, and county CCS programs as well as new financial incentives that encouraged referral of potentially eligible children to CCS. This study highlights the impact of such a "carve-out" approach on children's participation in CCS and explains why the case-finding and expenditure effects were found.

Principal Findings

The findings for claimant volume suggest that the carve-out had an independent effect in increasing claimant volume. Health plans and physicians alike had a clear financial incentive to identify and refer CCS eligible children to the CCS program. While some of this change can likely be attributed to the financial incentives for physicians and health plans, there are other explanations for the increased participation. California's carve-out of CCS services from prepaid care increased the visibility of the CCS program to the provider community as well as to local Medi-Cal programs that are one source of CCS referrals.

Impact of carve-out incentives on caseloads

The total number of children identified with CCS eligible medical diagnoses increased substantially for children in most managed care expansion counties. Increased managed care participation was associated with increased claimant activity for children in the mandatory managed care group as well as among those who were in a non-mandatory managed care group, and enrolled voluntarily. Carve-out impact also be evaluated based on how composition of the CCS caseload appeared to change. Analysis of claimant volume by diagnostic category indicated that the carve-out effect extended to children with a variety of different medical diagnoses, which tends to support a general rather than a diagnosis-specific carve-out impact. There was no reliable way of determining whether the increase in monthly CCS claimants was in part or largely due to newly referred children, who before the carve-out would not have received CCS-authorized services. Whether increased claimant volume was due to newly referred children or to greater periodicity of CCS-authorized claims among children already known to CCS, changes to per claimant expenditures did occur and are relevant to how the caseload is characterized and (in future) to the mean expenditures per claimant.

Overall, the study shows that authorizations for a greater volume of children are being handled by CCS within a given month. This study focused on changes to the CCS caseload as defined by monthly claimants, although from a CCS program perspective, those children who are referred and

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temporarily have an open case while medical eligibility is determined are important for workload purposes. The CCS authorized expenditures evaluated in this study refers to authorizations that are approved and does not consider (1) authorization requests handled by CCS that did not result in authorization, or (2) referrals of children to CCS that did not result in any authorization. It is worth noting that any effect on referrals, whether or not they result in authorization and are therefore captured within these data, has a number of possible, positive effects. One is that the carve-out incentive apparently worked in increasing the sensitivity of providers and/or of health plans to CCS eligible medical diagnoses. This creates an opportunity for the health plan to identify and intervene with a vulnerable population. While the study did not address whether and how health plans developed infrastructure or procedures to facilitate the referral process, the incentives and opportunity appeared to be present. The carve-out also creates an opportunity for CCS to interact with the provider, with the health plan, and with the family not only to increase knowledge about CCS (for the providers and health plans) but also to extend referral sources to families during the time period of eligibility determination, irrespective of the determination outcome.

These opportunities may be considered by some to be positive outcomes of the carve-out policy. Increased sensitivity of health plans or providers to the CCS program, and to CCS eligible children as a population of children with special health needs, can be an important end in itself. However, it is important to consider what these outcomes mean in the context of future policy choices. The carve-out policy emerged from a legislative initiative and has been renewed since that time. If it is not a permanent policy decision in Califonia, then the carve-out policy may have served as an educational process for all of the different providers and agencies in the CCS system.

From the finding of increased service authorization, it is clear that CCS is able to enforce its paneling and related standards for a greater volume of services. Whether or not this enforcement extends to a greater volume of children in the post carve-out period, relative to the pre carve-out period, is not directly addressed by this research. The additional services that appeared to be authorized by CCS in the post carve-out period might have been delivered by the same provider and in the same setting if authorized by Medi-Cal (or within the prepaid health plan, absent any cost-shifting practices). If so, then the carve-out impact could be largely a change in authorizing entity rather than any change in provider or setting. Also as noted earlier, is not possible to know with confidence based on data used for this study whether any of the monthly claimants in the post carve-out period are children who would not have been known to CCS in the absence of the managed care expansion and carve-out. Administrative data within Children's Medical Services at either the state or county level would be required to distinguish previously "known" from "unknown" children who have CCS claims with adequate reliability.

Impact of carve-out incentives on expenditures

Expenditures did not increase among mandated beneficiaries as expected in the Two Plan counties, despite the increased volume of claimants. Some models but not others suggested increased expenditures in the non-mandated group of beneficiaries, as a function of managed care participation, although participation was quite low. In the expansion COHS counties, there was a trend toward

increased post carve-out expenditures, even when comparison counties were included to try to control for statewide patterns. This post carve-out increase was statistically significant when the COHS counties were compared with eight non-expansion counties that operated independent CCS programs, but was not significant when the preferred group of comparison counties was used.

The fact that inpatient hospital services comprised approximately 84 percent of monthly expenditures during the study period helps to explain why overall expenditure increases were not consistently found. Monthly expenditures for physician inpatient and for hospital outpatient services, for both mandatory and non-mandatory groups, in Two Plan counties. Expenditures for physician ambulatory services and pharmaceuticals did not increase for the Two Plan counties as might have been expected.

Claimant volume changes help to explain the expenditure trends further. In the Two Plan counties, the number of children with claims for ambulatory physician and for hospital outpatient services increased with the carve-out. In contrast, and as expected, there was little change to the monthly number of children receiving inpatient hospital services. It was expected that CCS authorization of hospital inpatient stays would not be as sensitive as ambulatory services to the carve-out incentives. This finding held for mandatory and for non-mandatory groups. Among those claimants mandated to participate in post carve-out managed care, monthly expenditures for physician office services, hospital outpatient services, and hospital inpatient services declined per recipient of those services. This suggested lower intensity service per recipient, which is consistent with a carve-out effect of increasing CCS program participation among "marginally eligible" children with lower expected CCS costs. At the same time, costs per recipient in the non-mandated group did not change for these service types.

Impact on CCS agencies

The findings suggest that the CCS carve-out had a significant impact on the county CCS programs. Since the policy change, the public agency has had increased interaction with the private providers (managed care organizations and physicians) about the needs of Title V eligible children. In interviews conducted in several CCS programs, administrators noted the potential role of CCS programs in following what services children are able to obtain and are unable to obtain in the community. However, as yet they have few data about use of services that they can use for this oversight.

Results from the claims data lends to support to the observation reported by numerous CCS administrators that the carve-out had significantly affected the volume of referrals to CCS. It is possible that the carve-out contributed to more children being identified as potentially CCS eligible, as well as more services identified as CCS-related for children already known to CCS.

The organizational impact of the carve-out for CCS programs and for health plans is largely outside the scope of this study but an important question for a more comprehensive carve-out evaluation. For example, one CCS administrator noted that the state government expected that the carve-out

policy would reduce the workload to CCS programs even though CMS anticipated a significant workload increase to administer the carve-out policies and procedures. This study identifies several ways in which information on caseload and carve-out impact could be applied within the CCS program. While local CCS programs have access to figures on referral volume and on outcomes of medical eligibility determination, which they compile, more detailed information on claimant activity is not currently accessible.

A general issue rasied in this research is that some findings were sensitive to the group of comparison counties used. Results were presented with and without these comparison counties, and two different groups of counties were used, so that this sensitivity would be clear. The fact that California's managed care expansion counties differ from most non-expansion counties in population as well as in health system and provider network characteristics means that any comparison group will be imperfect. It highlights the importance of future analyses that can explore these differences and what they may mean for future managed care expansion.

APPENDIX A—MEDI-CAL AND COUNTY CHARACTERISTICS

Table A.1 – Descriptive information for Medi-Cal eligibility aid categories

Aid Code	CATEGORIZATION SCHEME	Summary categories of aidcodes	Aidcode appears in CCS claims file?	Medi-Cal benefits: Full Medi-Cal benefits? (R=restricted)	Share-of-cost (SOC)?	Medi-Cal managed care policy: Managed care mandatory in all MCMC counties?	MC mand. some counties?	MC vol. some/all?	Mean monthly statewide enrollment CY 1996
7A	100% Program	100% Pov.	Y						19,575
7C	100% Program	100% Pov.	Y	R					4,480
72	133% Program	133% Pov.	Y						81,387
74	133% Program	133% Pov.	Y	R					3,197
44	185% Program - Pregnant	185% Pov.	Y	R					26,945
47	185% Program - Infants	185% Pov.	Y						37,805
48	185% Program - Pregnant	185% Pov.	Y	R					21,418
49	185% Program - Pregnant	185% Pov.	Y	R					1,443
69	185% Program - Infants	185% Pov.	Y	R					63
76	60-Day Post Partum Program	185% Pov.	Y	R					1,866
7	200% Program - Infants	200% Pov.		R					1
70	200% Program - Pregnant	200% Pov.	Y	R					873
75	200% Program - Pregnant	200% Pov.		R					71
79	200% Program - Infants	200% Pov.	Y	R					151
3	MIC - no SOC	MI Youth	Y				Y	Y	13,714
4	MIC - no SOC	MI Youth	Y				Y	Y	6,123
4K	MIC - no SOC	MI Youth	Y				Y	Y	332
5K	MIC - no SOC	MI Youth	Y					Y	54,411
45	MIC - no SOC	MI Youth	Y			Y			3,204
82	MIC - no SOC	MI Youth	Y			Y			251,422
83	MIC - SOC	MI Youth	Y				Y		3,092
23	MN - LTNG - Blind	MN AB	Y				Y		299
24	MN - no SOC - Blind	MN AB	Y				Y	Y	465
27	MN - SOC - Blind	MN AB	Y				Y		58
34	MN - no SOC - Families	MN AFDC	Y			Y			429,142
37	MN - SOC - Families	MN AFDC	Y		Y		Y		9,293

Aid Code	CATEGORIZATION SCHEME	Summary categories of aidcodes	Aidcode appears in CCS claims file?	Medi-Cal benefits		Medi-Cal managed care policy			Mean monthly statewide enrollment CY 1996
				Full Medi-Cal benefits? (R=restricted)	Share-of-cost (SOC)?	Managed care mandatory in all MCMC counties?	MC mand. some counties?	MC vol. some/all?	
63	MN - LTNG - Disabled	MN ATD	Y		Y/N		Y		12,917
64	MN - no SOC - Disabled	MN ATD	Y				Y	Y	28,450
65	MN - SOC - Disabled	MN ATD	Y		Y		Y		43
67	MN - SOC - Disabled	MN ATD	Y		Y		Y		9,728
13	MN - LTNG - Aged	MN OAS			Y/N		Y		55,887
14	MN - no SOC - Aged	MN OAS					Y	Y	49,751
17	MN - SOC - Aged	MN OAS			Y/N		Y	Y	7,144
6A	Title II Disregard - Blind	Pub. Asst. AB					Y	Y	27
20	Cash Grant - Blind	Pub. Asst. AB	Y				Y		25,359
22	Cash Grant - Blind	Pub. Asst. AB	Y						0
25	TITLE II Disrgrd - AB	Pub. Asst. AB	Y						0
26	Title II Disregard - Blind	Pub. Asst. AB					Y	Y	347
28	In Home Support - Blind	Pub. Asst. AB	Y				Y	Y	538
3A	Cash Grant - Family	Pub Asst AFDC	Y			Y			29
3C	Cash Grant - Family	Pub Asst AFDC				Y			1
3G	Cash Grant - Family	Pub Asst AFDC				Y			10
3H	Cash Grant - Family	Pub Asst AFDC				Y			1
3P	Cash Grant - Family	Pub Asst AFDC	Y			Y			613
3R	Cash Grant - Family	Pub Asst AFDC	Y			Y			34,971
4C	Cash Grant - Family	Pub Asst AFDC	Y				Y	Y	191
6	Cash Grant - Family	Pub Asst AFDC							0
30	Cash Grant - Family	Pub Asst AFDC	Y			Y			1,918,313
32	Cash Grant - Family	Pub Asst AFDC	Y			Y			5,214
33	Cash Grant - Family	Pub Asst AFDC	Y			Y			613
35	Cash Grant - Family	Pub Asst AFDC	Y			Y			653,315
38	Cash Grant - Family	Pub Asst AFDC	Y			Y			152,023
39	Cash Grant - Family	Pub Asst AFDC	Y			Y			42,021
40	Cash Grant - Family	Pub Asst AFDC	Y				Y		17,372
42	Cash Grant - Family	Pub Asst AFDC	Y				Y	Y	62,146
43	Cash Grant - Family	Pub Asst AFDC	Y					Y	24
46	Title II Disregard - Families	Pub Asst AFDC	Y						0

Aid Code	CATEGORIZATION SCHEME	Summary categories of aidcodes	Aidcode appears in CCS claims file?	Medi-Cal benefits		Medi-Cal managed care policy			Mean monthly statewide enrollment CY 1996
				Full Medi-Cal benefits? (R=restricted)	Share-of-cost (SOC)?	Managed care mandatory in all MCMC counties?	MC mand. some counties?	MC vol. some/all?	
54 Cash Grant - Family	Pub Asst AFDC		Y			Y			195
59 Cash Grant - Family	Pub Asst AFDC		Y			Y			13,361
77 Cash Grant - Family	Pub Asst AFDC								2
78 Cash Grant - Family	Pub Asst AFDC								1
6C Title II Disreg - Disabled	Pub. Asst. ATD		Y				Y	Y	503
36 Title II Disreg - Disabled	Pub. Asst. ATD						Y	Y	85
60 Cash Grant - Disabled	Pub. Asst. ATD		Y				Y	Y	714,175
62 Cash Grant - Disabled	Pub. Asst. ATD		Y						0
66 Title II Disreg - Disabled	Pub. Asst. ATD		Y				Y	Y	9,509
68 In Home Support - Disabled	Pub. Asst. ATD		Y				Y	Y	6,327
10 Cash Grant - Aged	Pub. Asst. OAS						Y	Y	341,140
12 Cash Grant - Aged	Pub. Asst. OAS								0
15 TITLE II Disrgrd - OAS	Pub. Asst. OAS								0
16 Title II Disregard - Aged	Pub. Asst. OAS						Y	Y	15,009
18 In Home Support - Aged	Pub. Asst. OAS						Y	Y	13,085
51 IRCA Aliens	IRCA Aliens		Y		Y/N				12
52 IRCA Aliens	IRCA Aliens		Y	R	Y/N				23
56 IRCA Aliens	IRCA Aliens		Y		Y/N				6
57 IRCA Aliens	IRCA Aliens		Y	R	Y/N				18
5F OBRA Aliens	OBRA Aliens		Y	R	Y/N		Y (Napa)		54,411
55 OBRA Aliens	OBRA Aliens		Y	R			Y		228
58 OBRA Aliens	OBRA Aliens		Y	R	Y/N		Y		230,793
0A Refugees	Refugees		Y			Y			0
1 Refugees	Refugees		Y			Y			2,430
2 Refugees	Refugees		Y			Y			1,096
8 Refugees	Refugees					Y			0
53 MIA - SOC - LTC	MI Adult			R	Y		Y		492
81 MIA - no SOC - Aid Pending	MI Adult						Y		12
86 MIA - no SOC - Pregnant	MI Adult		Y				Y	Y	11,650
87 MIA - SOC - Pregnant	MI Adult		Y		Y		Y		245

Table A.2 – Commercial health plans operating in managed care expansion counties, pre and post carve-out

MC model	County	Commercial plans	
		Pre carve out (PHPs)	Post carve-out (Commercial Plan)
MC expansion counties—Early implementing counties (4)			
2-plan	Alameda	Kaiser Health Plan	Blue Cross of California
2-plan	Kern	---	Blue Cross of California
COHS	Orange	---	--- [a]
COHS	Santa Cruz	---	---
Other MC expansion counties (10)			
2-plan	Contra Costa	Kaiser Health Plan	HealthNet [b, c]
2-plan	Fresno	---	Blue Cross of California [d] HealthNet [b, d]
2-plan	Los Angeles	Care America Care First CIGNA Health Plan Community Health Plan FHP, Inc. Foundation Health Plan Kaiser Health Plan Maxicare PacifiCare United Health Plan Universal Care	HealthNet [b]
2-plan	Riverside	Blue Cross of California Kaiser Health Plan PacifiCare MaxiCare	Molina Medical Centers
2-plan	San Bernardino	Universal Care Blue Cross of California Foundation Health Kaiser Health Plan PacifiCare MaxiCare	Molina Medical Centers
2-plan	San Francisco	Foundation Health Kaiser Health Plan Pacificare	Blue Cross of California
2-plan	San Joaquin	Kaiser Health Plan	OMNI
2-plan	Santa Clara	Kaiser Health Plan	Blue Cross of California
2-plan	Stanislaus	---	OMNI
2-plan	Tulare	---	HealthNet [b] Blue Cross of California [d]
Other MC expansion counties—Unique MC models			
GMC	San Diego		Kaiser Health Plan

MC model	County	Commercial plans	
		Pre carve out (PHPs)	Post carve-out (Commercial Plan)
			Universal Care Sharp Health University of Calif—San Diego Community Health Group Blue Cross of California HealthNet
Other MC expansion counties—Not implementing CCS carve-out			
GMC	Sacramento	Kaiser Health Plan	HealthNet Blue Cross of California Kaiser Maxicare Omni Western Health University of Calif—Davis

Sources: Data from Medical Care Statistics Section; Medi-Cal Managed Care Division (MMCD) 12/13/99

[a] The COHS in Orange (CalOptima) contracts with multiple prepaid health plans

[b] Foundation Health Plan was the contracting health plan when the CP first became operational and was subsequently merged into HealthNet.

[c] The CP in Contra Costa was switched from HealthNet to Blue Cross of California in 1998.

[d] No Local Initiative was developed, and thus the county has two operating CPs.

Aid Code	CATEGORIZATION SCHEME	Summary categories of aidcodes	Aidcode appears in CCS claims file?	Medi-Cal benefits		Medi-Cal managed care policy			Mean monthly statewide enrollment CY 1996
				Full Medi-Cal benefits? (R=restricted)	Share-of-cost (SOC)?	Managed care mandatory in all MCMC counties?	MC mand. some counties?	MC vol. some/all?	
7F	Presump Eligibility-Pregnant	Pres Elig - Prg		R					0
7G	Presump Eligibility-Pregnant	Pres Elig - Prg	Y	R					0
80	QMB - Only	QMB - Only		R					2,723
7H	Medi-Cal Tuberculosis Program	TB Program	Y	R					609
71	Renal Dialysis	Dialysis	Y	R	Y/N				25
73	Total Parenteral Nutrition	TPN	Y	R	Y/N				10
7M	Minor Consent	Minor Consent	Y	R	Y/N				0
7P	Minor Consent	Minor Consent	Y	R	Y/N				3
7R	Minor Consent	Minor Consent		R	Y/N				0

Table A.3 – Socioeconomic characteristics of counties

County	Percent of children under 18 yrs living in families below FPL				Per capita personal income					Population of children 0-21 yrs				
	1993 N	1993 %	1995 %	93-95 %Δ	1994 $	1995 $	1996 $	1997 $	94-97 %Δ	1994 N	1995 N	1996 N	1997 N	94-97 %Δ
MC expansion counties—Early implementing counties (4)														
Alameda	61,698	18.5%	17.3%	-6.5%	25,114	26,553	27,864	29,683	18.2%	408,504	410,193	415,039	418,399	2.4%
Kern	62,108	30.4%	27.8%	-8.6%	16,790	17,335	17,810	18,319	9.1%	228,473	231,274	235,008	237,072	3.8%
Orange	128,447	18.9%	16.4%	-13.2%	26,534	27,735	28,936	30,115	13.5%	813,845	827,629	845,102	863,239	6.1%
Santa Cruz	11,049	18.3%	17.8%	-2.7%	24,846	26,288	27,896	29,406	18.4%	74,380	75,168	76,305	77,083	3.6%
Other MC expansion counties (10)														
Contra Costa	31,752	13.7%	12.3%	-10.2%	29,710	31,266	32,881	33,869	14.0%	261,411	265,039	270,025	274,357	5.0%
Fresno	101,932	41.1%	36.3%	-11.7%	17,802	18,367	19,012	19,179	7.7%	279,939	283,474	288,196	290,057	3.6%
Los Angeles	940,152	36.6%	33.7%	-7.9%	22,584	23,885	24,945	25,719	13.9%	3,035,116	3,037,523	3,065,002	3,080,759	1.5%
Riverside	91,901	21.9%	19.7%	-10.0%	18,827	19,316	19,950	20,645	9.6%	472,940	484,859	496,976	508,082	7.4%
San Bernardino	130,360	24.9%	22.9%	-8.0%	17,239	17,692	18,327	18,673	8.3%	588,023	596,555	608,292	615,334	4.6%
San Francisco	28,056	22.0%	20.6%	-6.4%	33,733	36,811	39,249	40,357	19.6%	153,644	154,179	155,439	155,561	1.2%
San Joaquin	46,031	27.9%	27.2%	-2.5%	18,274	18,845	19,531	20,092	9.9%	187,252	190,698	194,964	198,085	5.8%
Santa Clara	56,345	14.0%	13.4%	-4.3%	29,757	32,707	35,395	37,856	27.2%	474,695	481,256	491,120	496,808	4.7%
Stanislaus	33,856	25.1%	24.6%	-3.6%	17,602	18,037	18,953	19,650	11.6%	149,878	152,281	155,469	157,556	5.1%
Tulare	47,795	38.7%	37.3%	-3.6%	15,712	16,035	16,905	17,116	8.9%	137,167	138,715	140,627	141,706	3.3%
Other MC expansion counties														
San Diego	178,224	25.3%	22.7%	-10.3%	22,111	23,201	24,282	24,965	12.9%	851,956	860,766	878,224	893,070	4.8%
Non-MC expansion counties (36)														
All county total (*wtd*)	224,838	21.6%	21.3%	-1.4%		18,981	19,810	20,459	7.8%	1,197,892	1,213,949	1,235,222	1,250,865	4.4%

County	Percent of children under 18 yrs living in families below FPL				Per capita personal income					Population of children 0-21 yrs				
	1993 N	1993 %	1995 %	93-95 %Δ	1994 $	1995 $	1996 $	1997 $	94-97 %Δ	1994 N	1995 N	1996 N	1997 N	94-97 %Δ
Statewide (all 58 counties)														
All counties	2,331,091	26.4%	24.3%	-8.0%	23,024	24,229	25,368	26,314	14.3%	10,323,037	10,423,999	10,589,532	10,709,012	3.7%

Columns 1-3: U.S. Census Bureau, Small Area Income and Poverty Estimates Program—County estimates for people under age 18 in poverty for California: 1995 (population as of July 1996) (www.census.gov/cgi-bin/hhes/saipe93/gettable.pl)

Columns 4-8: U.S. Department of Commerce, Bureau of Economic Analysis, Economics and Statistics Administration—California total person income and per capita personal income, Survey of Current Business, May 1998 and May 1999 (www.bea.doc.gov/bea/regional/reis/scb/svy_ca.htm)

Columns 9-13: U.S. Census Bureau, Population Division. Estimates of the population of counties by age, sex, race and Hispanic origin: 1990-1997.

Table A.4 – Medi-Cal enrollment characteristics of California counties, 1994—1997

Medi-Cal MC model	County	Total population	Total children 0-21 yrs	Children 0-21 yrs enrolled in Medi-Cal		Pct. (%) of Medi-Cal enrollees 0-21 yrs		Pct. (%) of population enrolled in Medi-Cal			
		1994 Jul	1994 Jul	1994 Jan	1997 Jan	1994 Jan	1997 Jan	1994	1995	1996	1997
Early implementing MC expansion counties (4)											
2-plan	Alameda	1,352,000	408,504	103,912	99,740	51.7	51.0	15.1	15.2	14.8	13.6
2-plan	Kern	622,900	228,473	75,025	87,061	58.6	58.9	21.4	23.1	24.0	22.7
COHS	Orange	2,615,300	813,845	162,617	156,296	57.0	56.8	11.1	11.2	10.8	9.7
COHS	Santa Cruz	241,000	74,380	14,063	14,521	52.0	53.0	11.6	12.0	11.5	10.6
Other MC expansion counties (10)											
2-plan	Contra Costa	874,700	261,411	47,812	48,128	52.0	52.3	10.6	10.8	10.7	10.2
2-plan	Fresno	757,100	279,939	129,179	126,996	60.1	60.1	28.5	28.8	28.0	26.0
2-plan	Los Angeles	9,237,500	3,035,116	1,063,079	1,047,297	58.1	57.7	20.1	19.7	19.5	18.5
2-plan	Riverside	1,379,600	472,940	118,139	127,374	58.8	59.9	14.9	15.6	14.9	14.4
2-plan	San Bernardino	1,608,300	588,023	188,059	188,670	60.0	60.8	19.7	20.1	19.1	19.8
2-plan	San Francisco	753,400	153,644	45,349	40,103	37.7	35.1	16.0	15.9	15.3	14.3
2-plan	San Joaquin	526,600	187,252	69,230	70,953	57.0	57.1	23.4	23.5	23.5	22.2
2-plan	Santa Clara	1,591,900	474,695	99,764	88,640	52.3	50.2	12.2	12.0	11.3	10.0
2-plan	Stanislaus	417,200	149,878	49,895	52,704	54.8	55.8	22.3	23.0	22.9	21.6
2-plan	Tulare	352,100	137,167	61,808	63,249	59.1	59.9	29.8	30.0	29.9	28.3
Other MC expansion counties—Unique MC models (3)											
FFS/MCN	Placer	205,400	61,621	9,040	8,682	48.9	49.3	9.0	9.0	8.6	7.9
GMC	San Diego	2,705,800	851,956	197,001	188,902	55.4	54.9	13.2	13.5	13.1	11.9
FFS/MCN	Sonoma	427,500	123,667	19,885	19,962	48.7	49.2	9.8	10.2	9.8	9.0
Other MC expansion counties—Not implementing CCS carve-out (5)											
COHS	Napa[b]	119,000	33,516	5,813	5,846	51.0	52.1	9.6	9.8	9.5	8.8
GMC	Sacramento	1,137,400	353,954	127,590	133,076	55.9	55.9	20.3	21.1	20.9	20.5
COHS	San Mateo	689,900	183,908	25,969	25,214	49.4	48.4	7.9	8.0	7.7	7.0
COHS	Santa Barbara	394,400	124,519	27,612	28,239	56.8	57.6	12.5	12.7	12.6	11.6
COHS	Solano	375,300	126,737	23,689	25,779	54.2	54.7	11.8	12.1	12.6	12.2

Medi-Cal MC model	County	Total population	Total children 0-21 yrs	Children 0-21 yrs enrolled in Medi-Cal		Pct. (%) of Medi-Cal enrollees 0-21 yrs		Pct. (%) of population enrolled in Medi-Cal			
		1994 Jul	1994 Jul	1994 Jan	1997 Jan	1994 Jan	1997 Jan	1994	1995	1996	1997
Non-MC expansion counties (33)											
	Alpine	1,200	345	136	147	62.4	61.5	16.7	18.3	19.9	19.8
	Amador	33,500	8,228	1,198	1,314	48.7	50.6	7.5	8.0	7.9	7.7
	Butte	204,000	60,808	21,116	22,539	52.2	53.2	20.5	21.7	22.0	21.4
	Calaveras	38,300	10,432	2,401	2,746	51.6	52.7	12.4	13.7	13.8	13.9
	Colusa	17,700	6,388	1,976	2,095	58.0	58.5	19.6	20.7	20.5	19.0
	Del Norte	28,700	8,455	3,295	3,572	51.8	52.7	22.4	24.1	24.7	23.8
	El Dorado	146,400	44,726	6,501	6,559	51.4	51.7	8.8	9.1	9.1	8.3
	Glenn	26,500	9,360	3,311	3,237	58.7	58.4	21.8	21.5	21.3	20.3
	Humboldt	127,500	39,315	11,855	11,364	48.9	49.0	18.9	19.3	19.0	18.5
	Imperial	140,200	54,243	20,687	21,056	53.7	52.8	28.0	28.9	28.4	27.4
	Inyo	18,900	5,106	1,457	1,555	50.7	52.7	15.4	15.5	15.7	16.0
	Kings	115,700	40,871	14,244	15,120	59.8	60.5	21.1	21.6	22.1	20.7
	Lake	57,300	15,187	6,456	6,566	48.3	48.7	23.7	24.8	24.9	23.9
	Lassen	29,400	8,732	2,587	2,673	52.7	54.4	17.0	17.8	15.4	14.3
	Madera	108,200	38,805	14,640	16,562	57.8	58.7	23.8	25.4	25.9	24.6
	Marin	244,100	54,570	5,742	5,728	44.2	43.6	5.4	5.5	5.6	5.3
	Mariposa	16,400	4,162	1,144	1,202	51.0	53.7	13.8	14.3	14.0	14.3
	Mendocino	85,600	26,263	8,356	8,979	51.1	51.9	19.1	20.5	20.8	19.9
	Merced	201,200	80,276	36,789	38,317	60.6	60.5	31.0	32.6	32.6	30.0
	Modoc	10,500	2,986	1,162	1,313	50.9	53.7	22.7	24.5	24.9	23.2
	Mono	11,300	3,168	455	493	60.3	61.3	6.8	7.1	7.5	7.5
	Monterey	369,000	121,297	31,701	31,668	58.7	58.2	14.9	15.5	15.5	13.9
	Nevada	87,700	23,876	3,596	3,695	48.2	49.3	8.7	9.1	8.9	8.2
	Plumas	21,000	5,948	1,430	1,391	49.1	49.1	14.4	15.5	15.3	13.6
	San Benito	42,000	15,257	3,357	3,577	58.3	59.4	14.0	13.6	13.6	12.5
	S. Luis Obispo	1,608,300	68,407	11,133	12,093	50.3	51.2	9.7	10.3	10.4	9.8
	Shasta	164,500	51,942	16,230	18,098	50.3	51.2	19.8	20.8	22.0	21.4
	Sierra	3,400	972	202	196	44.6	45.7	12.1	11.0	12.7	11.7
	Siskiyou	46,000	13,632	4,830	4,801	50.1	49.9	21.1	21.7	22.0	21.0
	Sutter	74,200	25,018	7,321	7,206	53.4	53.4	18.5	18.9	18.3	17.8
	Tehama	55,100	16,899	6,452	6,293	54.7	54.8	21.4	21.9	21.9	20.7

Medi-Cal MC model	County	Total population	Total children 0-21 yrs	Children 0-21 yrs enrolled in Medi-Cal		Pct. (%) of Medi-Cal enrollees 0-21 yrs		Pct. (%) of population enrolled in Medi-Cal			
		1994 Jul	1994 Jul	1994 Jan	1997 Jan	1994 Jan	1997 Jan	1994	1995	1996	1997
	Trinity	13,900	4,046	1,305	1,262	50.8	48.6	18.2	18.5	19.3	18.8
	Tuolomne	53,100	13,920	3,274	3,461	50.1	50.7	12.4	13.4	13.5	12.9
	Ventura	713,400	238,579	41,255	42,501	55.7	56.6	10.5	10.7	10.7	10.0
	Yolo	151,200	51,994	13,025	13,372	54.4	54.6	15.8	16.0	16.0	15.5
	Yuba	63,800	23,679	10,706	10,991	57.4	58.0	29.4	31.1	32.6	29.9

Sources:

Column 3 (Total population): California DHS Medical Care Statistics Section, Highlights of the 1994 Program Changes (estimates from California Dept. of Finance for July 1994).

Column 4 (Total population 0-21 yrs): U.S. Census population estimates (http://www.census.gov/population/estimates/county/cas/co_cas.html)

Column 5-6 (Children 0-21 yrs in Medi-Cal): California DHS Medical Care Statistics Section, Monthly Medi-Cal Eligibility Extract files (January 1994, January 1997)

Column 7-8 (Pct. of Medi-Cal enrollees 0-21 yrs): Tabulations from Monthly Medi-Cal Eligibility Extract files (January 1994, January1997)

Columns 9-10: 1994 Annual Statistical Report; 1995 Annual Statistical Report; California's Medical Assistance Report, Annual Statistical Report, Calendar Year 1996; Advance Report—County Data, California's Medical Assistance Program, Calendar Year 1997 (July 1997).

Table A.5 – Participation of children 0-21 years in Medi-Cal managed care, by county 1994—1998 (mandated eligibility group only)

MCMC model	County	1994 (January)			1995 (January)			1996 (January)			1997 (January)			1998 (January)		
		PCCM[a] %	PHP[b] %	MCP[c] %	PCCM[a] %	PHP[b] %	MCP[c] %	PCCM[a] %	PHP[b] %	MCP[c] %	PCCM[a] %	PHP[b] %	MCP[c] %	PCCM[a] %	PHP[b] %	MCP[c] %
MCMC expansion counties—Early implementing counties (4)																
2-plan	Alameda	4%	1%	—	5%	1%	0%	4%	1%	0%	0%	0%	78%	0%	0%	82%
2-plan	Kern	0%	0%	—	0%	0%	—	0%	0%	—	0%	0%	73%	0%	0%	75%
COHS	Orange	6%	16%	—	4%	17%	94%	0%	0%	94%	0%	0%	100%	0%	0%	100%
COHS	Santa Cruz	0%	0%	—	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Other MCMC expansion counties (10)																
2-plan	Contra Costa	0%	22%	—	0%	21%	—	0%	22%	—	0%	21%	0%	0%	0%	77%
2-plan	Fresno	8%	0%	—	6%	0%	—	6%	0%	—	0%	0%	12%	0%	0%	79%
2-plan	Los Angeles	7%	23%	—	4%	25%	—	2%	28%	—	1%	34%	0%	0%	0%	44%
2-plan	Riverside	18%	3%	—	17%	4%	—	17%	11%	—	0%	9%	33%	0%	7%	37%
2-plan	San Bernardino	15%	8%	—	9%	13%	—	7%	22%	—	0%	19%	18%	0%	16%	36%
2-plan	San Francisco	0%	3%	—	0%	15%	—	0%	16%	—	0%	11%	21%	0%	0%	78%
2-plan	San Joaquin	0%	0%	—	0%	1%	—	0%	1%	—	0%	1%	54%	0%	0%	80%
2-plan	Santa Clara	2%	2%	—	2%	2%	—	2%	3%	—	2%	2%	13%	0%	0%	77%
2-plan	Stanislaus	0%	0%	—	0%	0%	—	0%	0%	—	0%	0%	—	0%	0%	80%
2-plan	Tulare	0%	0%	—	0%	0%	—	0%	0%	—	0%	0%	—	0%	0%	----
Other MCMC expansion counties—Unique MCMC models (3)																
FFS/MC N	Placer	0%	0%	—	0%	0%	—	0%	0%	—	0%	0%	—	0%	0%	66%
GMC	San Diego	12%	19%	—	8%	26%	—	6%	28%	—	10%	38%	—	3%	52%	0%
FFS/MC N	Sonoma	0%	1%	—	0%	1%	—	0%	1%	—	0%	1%	—	0%	1%	73%
Other MCMC expansion counties—Not implementing CCS carve-out (5)																
COHS	Napa	0%	0%	—	0%	0%	—	0%	0%	—	0%	0%	—	0%	0%	—
GMC	Sacramento	7%	1%	0%	0%	0%	50%	0%	0%	49%	0%	0%	70%	0%	8%	76%
COHS	San Mateo	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
COHS	Santa Barbara	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
COHS	Solano	0%	2%	0%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%

MCMC model	County	1994 (January)			1995 (January)			1996 (January)			1997 (January)			1998 (January)		
		PCCM[a]	PHP[b]	MCP[c]	PCCM[a]	PHP[b]	MCP[c]	PCCM[a]	PHP[b]	MCP[c]	PCCM[a]	PHP[b]	MCP[c]	PCCM[a]	PHP[b]	MCP[c]
		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Non-MCMC expansion counties—With voluntary MCMC (3)																
---	Madera	10%	0%	---	9%	0%	---	8%	0%	---	6%	0%	---	5%	0%	---
---	Marin	0%	3%	---	0%	3%	---	0%	3%	---	0%	3%	---	0%	3%	---
---	Yolo	0%	0%	---	10%	0%	---	0%	16%	---	0%	14%	---	11%	1%	---
Non-MCMC expansion counties—No MCMC (33)																
---	33 counties	0%	0%	---	0%	0%	---	0%	0%	---	0%	0%	---	0%	0%	---

Note:
[a]PCCM (Primary Care Case Management), [b]PHP (licensed Prepaid Health Plan), [c]MCP (Managed care plan contracting with SDHS post-expansion)
Shaded areas indicate post-MCMC expansion/carve-out period by county (as of January of the particular year).
Managed care expansion not yet implemented is indicated as ----.
Sacramento "CCS carve-in" includes the total enrollment in Kaiser plan codes (#171—175).
Sources:
California Dept. of Health Services, Medical Care Statistics Section, Eligibility Extract Files 1994-1998.
(Implementation dates): 1999 MCSS Annual Statistical Report

APPENDIX B—ISSUES IN TABULATION CLAIM EXPENDITURES AND IDENTIFYING UNIQUE CLAIMANTS

Two characteristics of the Medi-Cal claims data were examined to understand their implications for the study analysis. These characteristics were the following: (1) claims with "negative" payments, and claimants who had one or more months of net negative expenditures, and (2) claimants who appeared to have claims associated with more than one aid category in a given month.

To better understand the scope of these characteristics and the potential implications for inference, several questions were examined. These include whether there are patterns in the frequency of occurrence within and across counties and time periods; what plausible explanations exist; whether there are any distinguishing characteristics of those claimants for which either of these two situations occurred; whether these occurrences have any impact on inferences; and what solutions could be applied.

Claims with net 'negative' payments

Some claims in the dataset were negative adjustment claims for which no corresponding, original claims were found in the data. This was not expected because normally both the original claim and all subsequent adjustments to those claims appear in claims data. Records of past claims in the Medi-Cal claims data are not altered after payment. Instead, the Medi-Cal program makes adjustments by adding (1) a system-generated claim that when summarized reduces the amount paid in the original claim, or (2) a (negative) void claim along with a positive claim that has the adjusted paid amount.

The impact on payments per claim over time is illustrated in Alameda County. Annual rates of net negative claims were 1.3 percent of 14,557 claims in 1994, 6.6 percent of 16,432 claims in 1995, 1.6 percent of 18,575 claims in 1996, and 1.0 percent of 24,101 claims in 1997. A further consequence was at the claimant level. For approximately 10,054 children statewide, the tabulated net expenditures in at least one calendar month were actually less than zero. This was found in 16,484 "claimant months" (2.1 percent) of a total of 780,318 claimant months statewide from 1994 through 1997. Thus one impact was that a number of Medi-Cal beneficiaries appeared to have net negative CCS-authorized claim expenditures for one or more months. In addition, some beneficiaries appeared to have net negative claim expenditures overall. For these beneficiaries, aggregating paid claims from all study period months in which they had any claims produced a negative paid sum.

Dates of service and dates of check issue were examined for children who appeared to have net negative expenditures. Statewide 52.7 percent of all payment issue dates (for positive and negative claims combined) that applied to these children's claims were in August 1996 and 26.7 percent were in November 1997. A higher number of claims for these claimants had service dates for months of August 1995 through April 1996. It is not clear why there would be a systematic time

pattern in the service dates. Because the dataset was generated in November 1998 with a last service date of December 1997, it would not be surprising to find relatively *fewer* adjustments for those claims having service dates late in the study period, given the shorter time period in which such adjustments could occur and still be recorded in this dataset (by November 1998). A replicated claims file using records as of December 1999 produced a similar pattern.[89] The time pattern and results from the replicated 1999 version do not suggest date of dataset creation as a cause.

The following paragraphs discuss some plausible explanations for finding net negative claims and net negative expenditures for an individual. The section also outlines the approach to and results from investigating characteristics of affected claimants; a summary of the overall findings and implications for inference; and a discussion of possible solutions and what analytic advantages and disadvantages are involved.

First, it is possible that some original claim records did not become part of the study dataset, while adjustments to these claims were included. For those claimants with net negative expenditures, 13.1 percent of their total claim records were refunds to Medi-Cal and 86.4 percent were negative void and reissue claim records. A possible explanation stems from how the CCS claims extract was generated. Only claim records with a CCS authorization code were selected from the Medi-Cal claims data. If the original claim was not authorized by CCS but the child was subsequently referred to CCS, then the adjustment might have the CCS authorization flag even though the original claim did not. A special MCSS analysis suggests that this may explain part though not all of the pattern. A 10 percent sample of CCS-authorized claims for 1994-97 was used to identify all non-CCS authorized Medi-Cal paid claims for those individuals. This produced 226,454 CCS-authorized claims and 1,949,531 non-CCS Medi-Cal claims. An equivalent number of positive and negative void and reissue adjustments should be found. While for CCS claims there were 2,036 positive void and re-issue claims and 5,763 negative void and re-issue claims, adding the non-CCS claims resulted in 24,179 positive adjustments and 25,945 negative void and re-issue adjustments. Thus limiting the dataset to CCS claims (as in the study dataset) results in positive re-issue claims at 64.7 percent lower than expected. Including all of the child's claims (as in the MCSS 10 percent sample dataset) results in positive re-issues at 6.8 percent lower than expected. Combining CCS and Medi-Cal claims thus improves but does not eliminate the problem. It is not known what impact merging the CCS-authorized claims with other Medi-Cal claims had on per claim payments.

A second possible explanation is that a child's Medi-Cal eligibility aid code changed after incurring claims and that the subsequent adjustment claim (or claims) did not become linked to the child's

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[89] A replication of the claims file using all original and adjustment claim records for 1994-1997 as of December 1999 produced a similar pattern as the file created in November 1998. Higher volume of void and reissue adjustments occurred for July 1995 through May 1996 (MCSS 2000). Elevated frequencies of re-payments to Medi-Cal were evident for April 1994 through June 1995. Overall proportions of adjustment claims using (1) the original dataset of claims paid through November 1998 and (2) the replicated file with claims paid through December 1999 were similar. Rates for 1998 and 1999 were as follows, respectively: refund to Medi-Cal, 3.3 percent and 3.5 percent; positive void and re-issue, 0.8 percent and 0.9 percent; and negative void and re-issue, 1.9 percent and 2.0 percent.

original BID. If this occurred, it would explain the negative net paid claimant-months. As noted earlier, adjustments are made by adding a replicate claim with a different value in the payment field. The original and adjustment claims might have been "divided" across the child's BIDs with a common SSN but different aid category. It is unlikely that SSNs or aid categories on these adjustments would differ from those on the original claims (Klein personal communication 2000). It did not appear that the BIDs with a common SSN had more than the average frequency of negative service month expenditures.[90] Finally, if net negative totals are due to the original and the negative adjustments being split across BIDs, then this would explain negative per child payments but not net negative claims (since the same claim number would be used). Data from Alameda County does not support this explanation; no claim was found to have payment activity associated with more than one BID.

Measures of total claims, claimant-months, and total claimants were used to evaluate possible impact for research questions. Statewide, 1.1 percent of the 2,127,322 claims between 1994 and 1997 were net negative payments in a mandatory managed care group (using the Two Plan county definition) while another 3.6 percent of claims were net negative payments in a non-mandatory group. There was some variability by county, as illustrated in **Figure B.1, Total net positive, zero, and negative paid claims by county—By managed care group (M, NM) in 21 largest counties, and in Figure B.2**. Counties are ranked in these figures by total claim volume. The largest county (Los Angeles) also had the largest percent negative claims for both mandatory and non-mandatory groups.

Of the total "claimant (BID) months" statewide in the study period, estimated at 780,318, a total of 2.1 percent (16,484) showed net negative payments. Condensing these claimant-months to the claimant (BID) level showed that these were not all unique individuals. The total number of BIDs with net negative payments in one or more months was 10,054. Approximately 37.4 percent (3,762) of these BIDs with one or more net negative months had net positive expenditures when summed across the study period. Thus the total number of BIDs with net negative payments when summed in the study period was 6,390. Approximately 44.1 percent were from Los Angeles County, which as California's largest county had 34.4 percent of statewide claimants between 1994 and 1997.[91] The next largest percentage was in San Bernardino (the fourth largest CCS claimant county with 6.3 percent of study period claimants) at 6.9 percent of the statewide total. The total (negative) payments associated with these net negative BIDs statewide was $611,701. The mean per claimant amount statewide was –$38.45 (s.e. 13.87). In the expansion counties, the mean total expenditure amount for such claimants with net negative sums ranged from –$16.39 (s.e. 1.56) in Contra Costa to –$54.96 (s.e. 129.72) in San Francisco. The smallest Two Plan county of Tulare was a high outlier with mean of –$291.50 (s.e. 537.56).

The time patterns for negative claim and claimant totals statewide are provided in **Figure B.3, Monthly total claimants with net negative or net zero expenditures during study period**

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[90] This analysis would not capture claims "divided" across BIDs for newborns, whose SSN likely would change once the child's own SSN was assigned.

[91] Total claimants for this denominator are a count of unique BIDs; children who change aid categories will be counted once per aid category.

(1994-97, and absolute value of total net "negative" expenditures, for all 58 counties combined. This figure illustrates that total negative 'payments' and negative per claimant expenditures generally clustered together in the middle of the study period. The absolute value of the net "negative" expended is used to illustrate the magnitude and also the association with claimant-level patterns. Some large, net negative claims occurred throughout the study period that were not associated with the increased rate of negative claimant expenditures. Because some study questions use mandatory and non-mandatory comparisons, these measures were further stratified by mandatory group status. **Figure B.4, Percent of monthly total claimants with net negative or zero expenditures during study period (1994-97)**, shows negative expenditures as a percent of total expenditures and total per claimant expenditures over the study period, by managed care group. This figure uses the Two Plan county definition of mandatory participation. Rates of negative claimant-months were similar for both groups with one significant exception. The percent of affected monthly claimants was much higher for the mandatory group in the study months of late 1995 and early 1996. This figure also illustrates that the earliest carve-out effective dates in the expansion counties occurred during or after the affected time period. Other tabulations that pooled claimants statewide (data not shown) showed that the majority of the claimants with net negative expenditures were in aid eligibility categories within the mandatory managed care group. Using the Two Plan county definition for mandatory managed care participation, a total of 83.5 percent of claimants statewide with net negative expenditures were in the mandatory group. The other 16.5 percent (1,057) were in a non-mandatory managed care group.

Several factors were examined to further characterize the claimants who had net negative expenditures for CCS-authorized claims. The diagnostic coding, claim type, beneficiary age, and aid code were examined. To assess diagnostic characteristics, all diagnoses associated with claimants who had one or more net negative paid months were tabulated. On aggregate statewide, the majority of net negative claimant-months were associated with claimants having other/missing diagnosis information (largely pharmacy, V codes, and symptom codes). This "other" diagnosis category applied to 51.9 percent of claimants with one or more net negative months. The next largest category was respiratory illness at 17.7 percent, followed by sensory at 4.8 percent. The types of claims that were found for the claimants with net negative expenditures also were examined. For those individuals with net negative expenditures, nearly 90 percent of their claims were for medical (largely physician) services, with the remainder being outpatient, inpatient, or pharmacy claims. The proportion that was medical services compares to approximately 45 percent of the claims for all claimants during the study period. Analysis of Alameda County claims shows that only 0.4 percent of the net negative claims were for inpatient services while 12.3 percent of the typical, net positive claims were for inpatient services. Thus most affected claims were for physician visits.

As noted earlier, the majority of these children were found not to be infants. Approximately 18.4 percent were under the age of one year. Aid categories generally reflected the CCS claimant population. By aid code, the largest aid categories were 30 (cash assistance) at 40.3 percent of the total, 35 (cash assistance) at 19.2 percent, 82 (medically indigent child, no SOC) at 9.8 percent, and 34 (no cash assistance) at 9.4 percent. In general, the mean per beneficiary expenditure amount was larger (i.e., more negative) for the non-mandatory group relative to the mandatory

group in the expansion counties. The statewide means were –$49.83 (s.e. 46.27) for the non-mandatory group and –$35.46 (s.e. 12.61) for the mandatory group. The statewide totals (absolute values) were $446,822 for the mandatory group and $164,880 for the non-mandatory group. Another question was whether those with one or more net negative expenditure months but with overall positive expenditures (3,662 BIDs, or 36.4 percent of those statewide with any net negative paid month) shared characteristics with, or differed from, the claimants whose net expenditures were negative when summed across the study period (6,390 BIDs). There were some differences. The claimants identified with overall positive expenditures appeared to be slightly older (10.9 percent under age one year compared to 18 percent), more likely to be in aid category 60 (SSI) (60.2 percent compared to 3.8 percent), and less likely to be in the mandatory managed care group compared to those with overall negative expenditures (22.4 percent compared to 83.5 percent).

Figure B.1 – Total net positive, zero, and negative paid claims by county—By managed care group (M, NM) in 21 largest counties

Percent of total claims in county (1994-1997)

Legend:
- Pct positive (NM)
- Pct zero (NM)
- Pct negative (NM)
- Positive (M) as pct of all
- Pct zero (M)
- Pct negative (M)

County

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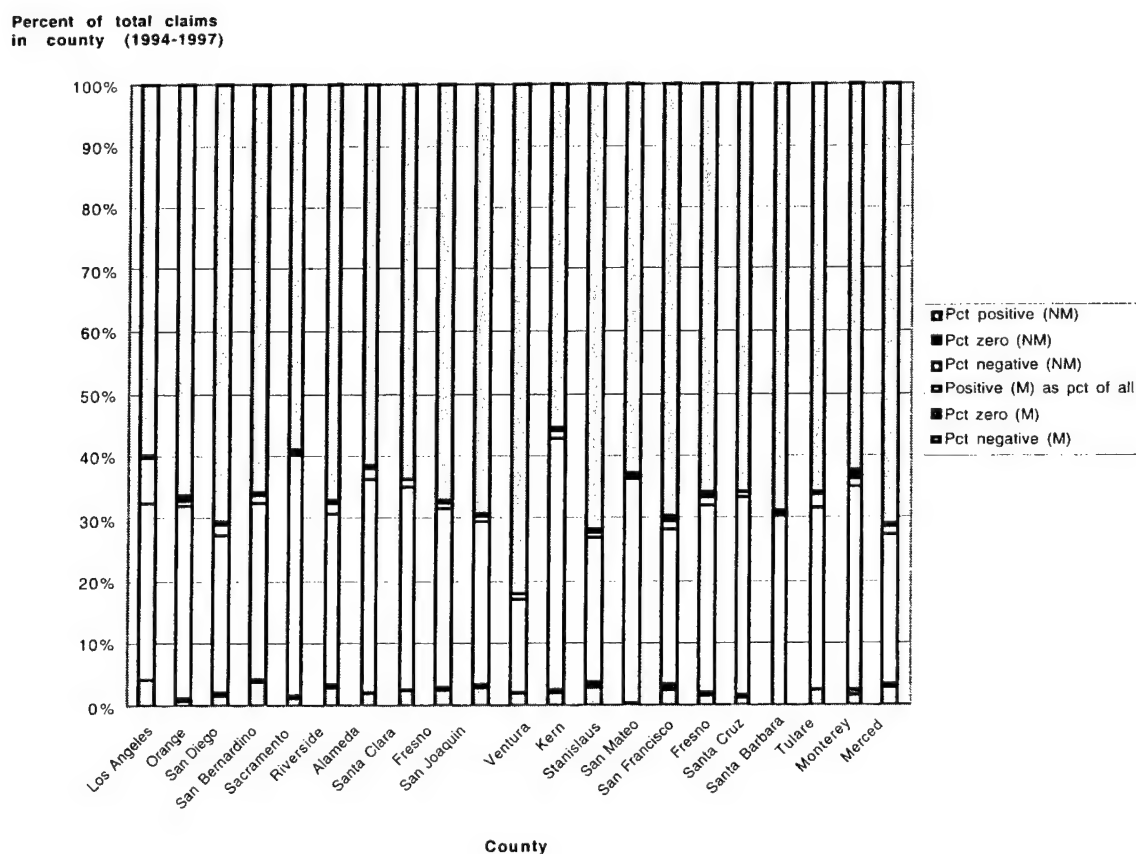
Figure B.2 – Total net positive, zero, and negative paid claims by county—By managed care group (M, NM) in 37 smaller counties

Percent of total claims in county (1994-1997)
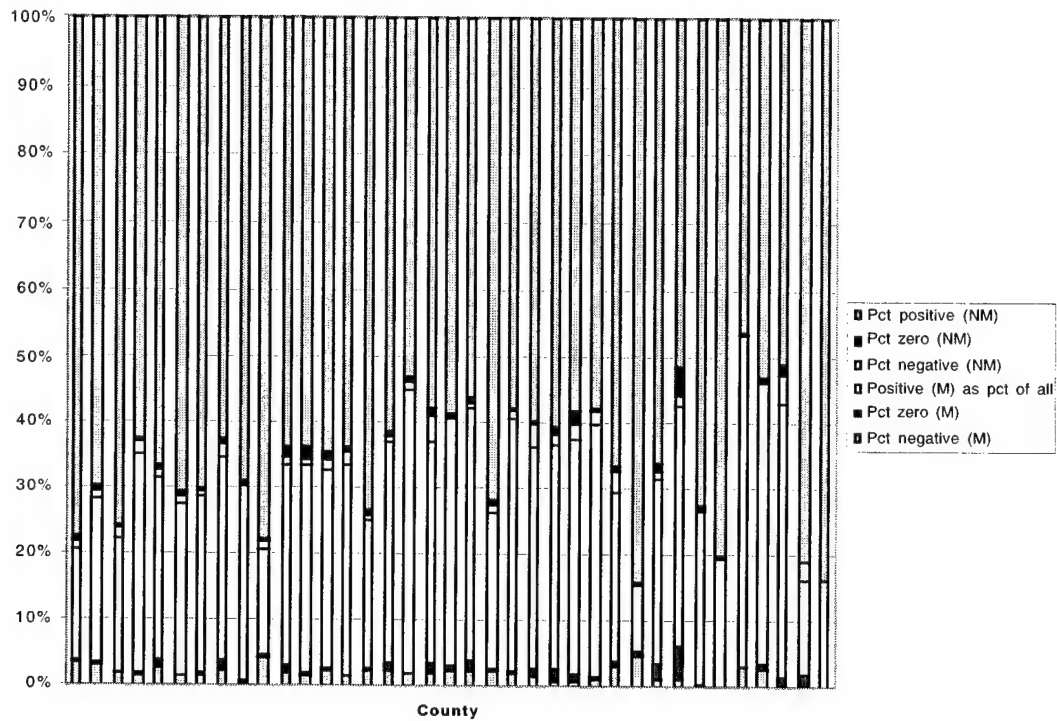
Legend:
- Pct positive (NM)
- Pct zero (NM)
- Pct negative (NM)
- Positive (M) as pct of all
- Pct zero (M)
- Pct negative (M)

County

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Figure B.3 – Monthly total claimants with net negative or net zero expenditures during study period (1994-97, and absolute value of total net "negative" expenditures, for all 58 counties combined

Figure B.4 – Percent of monthly total claimants with net negative or zero expenditures during study period (1994-97)

Percent of total monthly claimants

Legend:
- Pct net negative, mandatory
- Pct net negative, non-mand
- Pct net zero, mandatory
- Pct net zero, non-mand
- Absolute net neg paid, as pct

Earliest COHS and Two Plan start-up dates

Month (January 1994 – December 1997)

In summary, about 2.1 percent of claimant-months have implausible, net negative expenditures. It might be argued that these claims should be excluded and should not contribute to monthly claimant counts or to expenditure totals. If the child did not in fact incur expenditures in the month, then including these children within a given monthly count will overstate claimant volume. Also, retaining these monthly expenditure totals will underestimate monthly expenditures. Negative Medi-Cal expenditures for a claimant are not plausible, and the cause appears to be missing original claims. However, exclusion of these adjustment claims implies that the original claims would have been completely negated by the adjustment claims. This may not be the case. The fact that merging CCS-authorized and other Medi-Cal claims for a sample of CCS claimants did not eliminate the pattern leaves the cause unexplained. It does not rule out an absent CCS-authorization flag for some original claims as a contributing factor. Finally, these net negative occurrences were found for beneficiaries in both the mandatory and the non-mandatory groups. The impact is somewhat lessened because both comparison groups are affected.

Because the frequency and the total sum were higher for the mandatory group, including these net negative payment months if in fact they should be zero will tend to artifactually increase claimant volume and decrease total expenditure measures. Because the claimant-months occurred prior to or during early implementation dates, retaining these claimants in the monthly counts would tend to understate rather than overstate carve-out impact. Retaining the claimants makes pre carve-out period counts higher than perhaps they should be. This extends to mandatory versus non-mandatory comparisons as well as to pre-post carve-out comparisons. Because the expenditures involved are relatively small, the impact on monthly county expenditures likely would be small. It would tend to 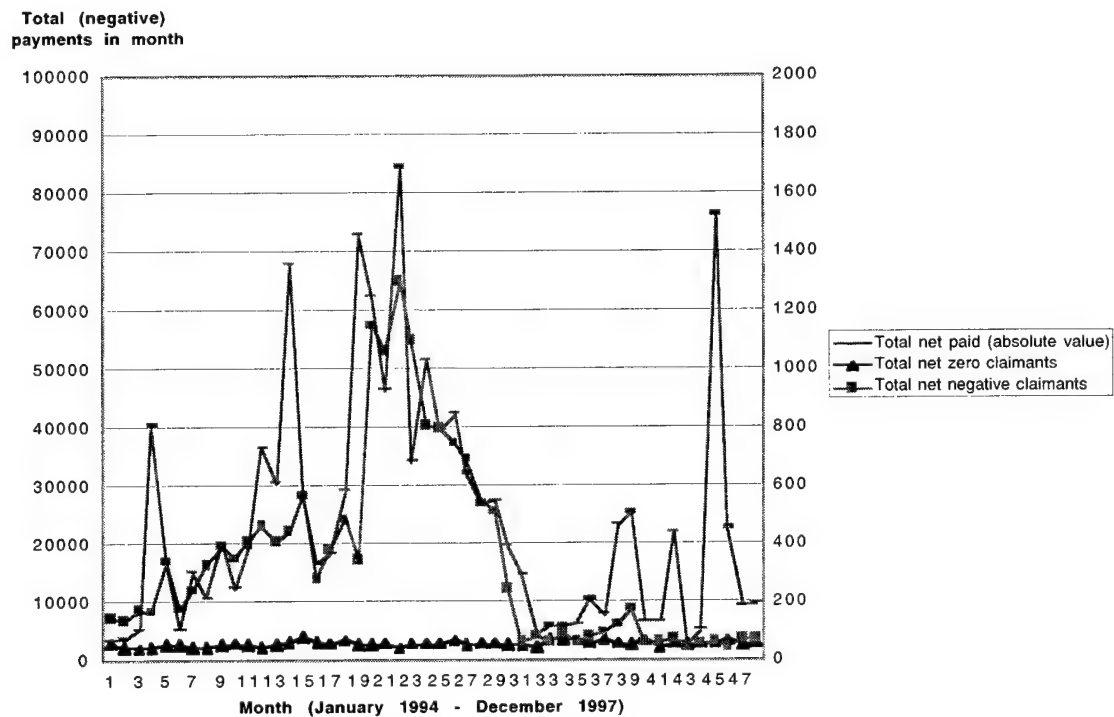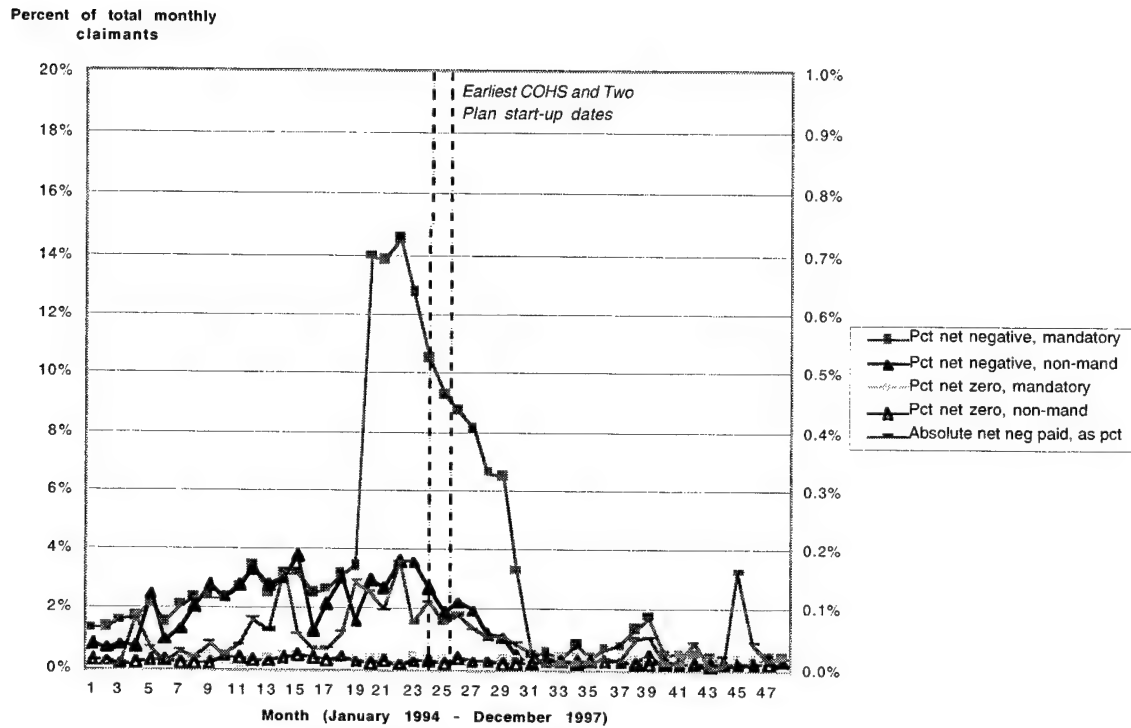understate pre-period mandatory group monthly expenditures. In general, these claimants and claims were retained in analyses of aggregate expenditures and counts. However, claimants who had net negative payments in a given month generally were not counted for that month when the distribution of expenditures per claimants was evaluated (**Section 6.4**).

Multiple BIDs for a CCS claimant

Some children change their Medi-Cal aid eligibility category one or more times during the study period. Reasons include changes in household income, cash assistance status (e.g., gain or loss of SSI benefits), age, disability status, and foster care status, among others. This is one reason that this study uses a measure of total monthly claimant activity to define the claimant volume outcome. Further, a limited number of individuals are known to have Medi-Cal services paid under more than one Medi-Cal eligibility aid category in a month. One reason is that beneficiaries who are simultaneously eligible for Medi-Cal under more than one category have their claims first reviewed for eligibility under the primary aid category. If not eligible under the primary category, eligibility is assessed under first and second special aid categories (Klein/MCSS 1999).[92]

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[92] Medi-Cal documentation states that analysis of eligibility records shows that when these first and second special aid categories are used to identify Medi-Cal eligibles in addition to the primary aid category, an additional 2.5 percent of eligibles are identified (Klein/MCSS 1999).

However, in the CCS claims data, some children—as defined by the SSN portion of the BID—appeared to have claims in a given month that were associated with different BIDs that all were full scope aid categories (as opposed to categories conferring restricted benefits). Assuming that a common SSN portion of the BID can be used to identify the same individual, then not accounting for this would produce total monthly claimant estimates that over-count the number of actual children participating in CCS during the month. Claimants have been defined for this study as children with unique BIDs who have a paid claim. Consequently some of the observed change in claimant volume could be an artifact of change in the volume of children having claims under more than one BID within the calendar month. What is most important is whether the incidence of the same child counted more than once as a claimant for a particular month changes over time. It also is important to know whether any changes that do take place over time occur differentially across the managed care comparison groups. Several steps were taken to examine the trends, to explore possible patterns within the trends, and to develop plausible explanations for the occurrences.

An explanation for paid services within a month from multiple aid codes that confer the same full Medi-Cal benefits is found in how claims are paid. The fiscal intermediary (EDS) uses an eligibility file created weekly as a basis for paying claims. This file (FAME) is extracted from the online Medi-Cal eligibility system (MEDS) used by local welfare and CCS program offices. The SSN or eligibility aid code for an individual could change from one extract to another drawn from the same month. While Medi-Cal eligibility is generally based on monthly income and is re-evaluated quarterly, within-month eligibility changes are possible.

The first question to evaluate in the claims data is how many children appear to have more than one associated BID. Each BID is composed of the individual's county code, the aid category, and the scrambled SSN (hereafter referred to as the SSN). One analysis examined whether a SSN is associated with more than one BID. (The following analysis focuses on changes within counties and does not track the SSN statewide). Such a "shared" SSN across BIDs could happen for several reasons that include the following: (1) the child is changing aid eligibility codes (e.g., from cash assistance to SSI); (2) the claimants are different individuals; and (3) a child is a twin infant with both twins having the mother's SSN, or both the mother and an infant are sharing the SSN and receiving CCS-authorized services.[93] Inaccuracies in the claims data are another possible explanation.

The proportion of children appearing to change aid categories over the course of the study period was estimated. Analysis at the county level indicates that these (expected) aid code changes did in fact occur.[94] For example, between 1994 and 1997 in Alameda County, 932 of the 6,644 unique

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[93] A child's claim may also have absent aid category information, thus resulting in a different "BID". These claims were generally excluded from the claimant volume and expenditure analyses as invalid claims.

[94] As earlier, this analysis assumes that the common (scrambled) SSN portion identifies the same individual at least in some cases. Because it is important for the study results not to overcount actual

SSNs were found to be associated with more than one BID (i.e., the unique combination of county code, aid code, and SSN). Another way of stating this is that approximately 2,063 of 6,644 unique BIDs had a SSN that was associated with at least one other BID during the study period. Of these SSNs in Alameda, most (82.1 percent) were associated with two BIDs. The next question was how many different birth dates were found within a specific, common SSN (to determine whether the same child or a twin might be involved). In Alameda, most of the BIDs associated with a SSN (92 percent, or 859 of 932) shared the same birth date, indicating that the multiple BIDs corresponded to the same individuals. The remaining 7.9 percent that did not share the same birth date could be siblings born in different years who are using the mother's SSN. This is confirmed by the fact that 96.6 percent of the unique BIDs with a shared SSN had the same birth date. Similar rates for shared date of birth were found in the other Two Plan and the expansion COHS counties. There is no reliable way of distinguishing between infant twins in the available claims data.

The analysis confirms that children change aid categories and also shows that in some cases there are BIDS with the same SSN but different aid categories who have claims in the same calendar month. This could pose a possible problem in inference about claimant volume. If the same child receives CCS-authorized services in a particular month under more than one eligibility aid code, then the child will be counted multiple times as a claimant. If the aid codes are in the same mandatory eligibility group, then the child in two aid codes will be counted as a monthly claimant twice. If the aid codes are in different mandatory groups, then the child will be counted as both a mandatory and a non-mandatory managed group member in the same month. For example, in Alameda there were 267 occurrences of an SSN being associated with more than one unique BID *within* any service month. This comprised 1.0 percent of the SSNs in Alameda across the study period. These occurrences did not only occur sporadically for a particular month. Some children as identified by SSNs appeared to have claims for more than one BID in a month, for two or three consecutive months.

This leads to two major issues. The first is that if a child has claims within more than one unique BID in a month, then the child will be "over counted" as a claimant under the operating definition of claimant as a unique BID with an authorized claim. The second is that a time trend could affect the pre-post and the comparison group differences in the study outcome.

The impact for the Two Plan expansion counties is illustrative. After excluding the unique BIDs that result due to a missing aid category ("00"), there were 4,368 instances in the 12 counties where there was a claim under a BID in a given month for a child (SSN) who already had been counted as a claimant under a different BID. These 4,368 claimant-months comprised 0.8 percent of the total 516,609 Two Plan claimant-months. This analysis treats each SSN as corresponding to one individual.[95] This rate can be further stratified. Approximately 0.2 percent of total

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monthly claimants, this analysis errs on the side of assuming that the common SSN identifies a unique individual.

[95] These figures capture the incidence of multiple BIDs occurring in the same or different managed care group. The percentages are total SSNs with multiple BIDs in particular managed care groups, as a proportion of all SSNs. The numerators are the total SSNs associated with more than one BID overall;

claimant-months were associated with an SSN that had more than one BID in the same, mandatory managed care group. Another 0.3 percent were associated with an SSN that had more than one BID in the same, non-mandatory managed care group. Finally, for another 0.4 percent of claimant-months, the child (as identified by the unique SSN) was being counted as a claimant in both a mandatory and a non-mandatory group. For the two expansion COHS counties, there were 683 claimant-months (1.3 percent of the total) where the SSN was contributing to more than one BID.

Another major question is whether there is a time trend in these occurrences. Of most concern would be a time trend of increasing overcounts over the course of the study period. A number of the Two Plan and COHS expansion counties showed an increasing trend.[96] Trends in the expansion counties suggest that these increases were common to both mandatory and non-mandatory groups. **Figure B.5, Monthly rate of shared SSNs by claimants in Two Plan counties—By mandatory group status of BIDs, over study period**, shows the trend for combined Two Plan counties. This figure treats a shared SSN as potentially identifying one unique individual with multiple BIDs. Each subtotal of (1) mandatory, (2) non-mandatory, and (3) mandatory plus non-mandatory represents a mutually exclusive total. For example, the mandatory subtotal represents the percent of SSNs with claim activity in a month where at least two BIDs associated with the SSN had claims and both had mandatory group aid categories. **Figure B.5** illustrates an increasing trend over the study period that accelerated for 1996 and 1997. Until the last few months of the study period, the largest proportion was SSNs in which one apparently associated BID was in a mandatory aid code and the other was in a non-mandatory aid code. The same measure is provided for the two pooled expansion COHS counties (Orange and Santa Cruz) in **Figure B.6**. Because mandatory status applies to nearly all Medi-Cal beneficiaries in these COHS counties, the rates are not stratified by mandatory group status. Unlike the Two Plan counties, the volume of such SSNs was greatest during the middle of the study period. To summarize, the maximum levels of claimant "overcounts" in Two Plan counties by month were as follows: 0.6 percent of mandatory group claimants, 1.6 percent of non-mandatory group claimants, and 0.9 percent where both a mandatory and non-mandatory claimant count occurred. For the COHS counties, the maximum monthly "overcount" was 3.6 percent.

As discussed earlier, some Medi-Cal beneficiaries will have eligibility conferred through more than one aid category in a given month (MCSS 1999). Consequently they could have claims associated with more than one aid category in a given month. One possibility is that children with claim activity through multiple BIDs in a month have primary eligibility through an aid category that confers restricted benefits (e.g., emergency services only, pregnancy-related services only). In these data—again using the assumption that the common SSN portion may be identifying the same

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the total SSNs with both BIDs in the non-mandatory group; the total SSNs with both BIDs in the mandatory group; and the total SSNs associated with BIDs in mandatory and non-mandatory groups. There also was some variation by county. For example, over the study period, the percentages with each category for Alameda and Orange counties (respectively) were as follows: total (1.0 percent, 1.2 percent), non-mandatory (0.2 percent, 0.4 percent), mandatory group (0.2 percent, 0.4 percent), and both groups (0.5 percent, 0.4 percent). For the missing aid category, the results were 0.1 percent for Alameda and 0.5 percent for Orange.

[96] An increase also appeared for the "missing aid category" BID group.

Figure B.5 – Monthly rates of shared SSNs by claimants in Two Plan counties—By mandatory group status (M, NM) of BIDs, over study period (monthly values sum to total SSNs affected)

Percent of SSNs with >1 BID claimant in month

Month (January 1994 - December 1997)

Legend:
- Multiple BIDs per SSN in grp M and NM
- Multiple BIDs per SSN in grp NM
- Multiple BIDs per SSN in grp M
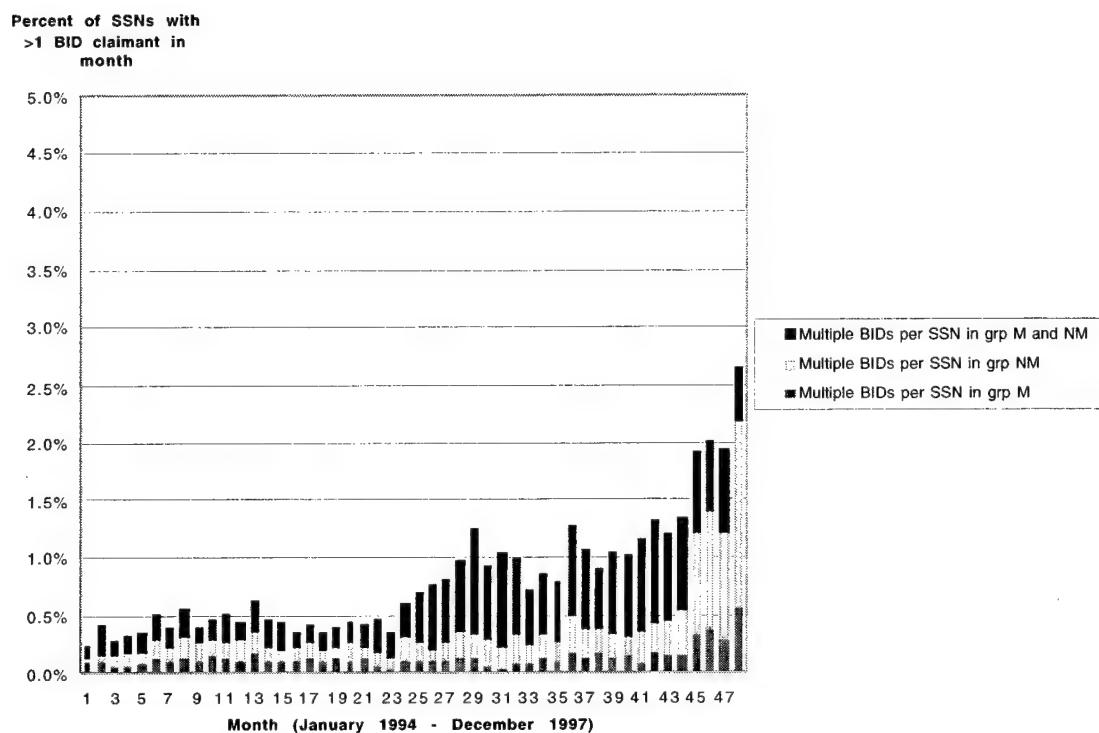
Figure B.6 – Monthly rate of shared SSNs by claimants in COHS expansion counties (Orange, Santa Cruz)—Total SSNs affected, over study period

Percent of SSNs with >1 BID claimant in month

Month (January 1994 - December 1997)

■ Multiple BIDs per SSN
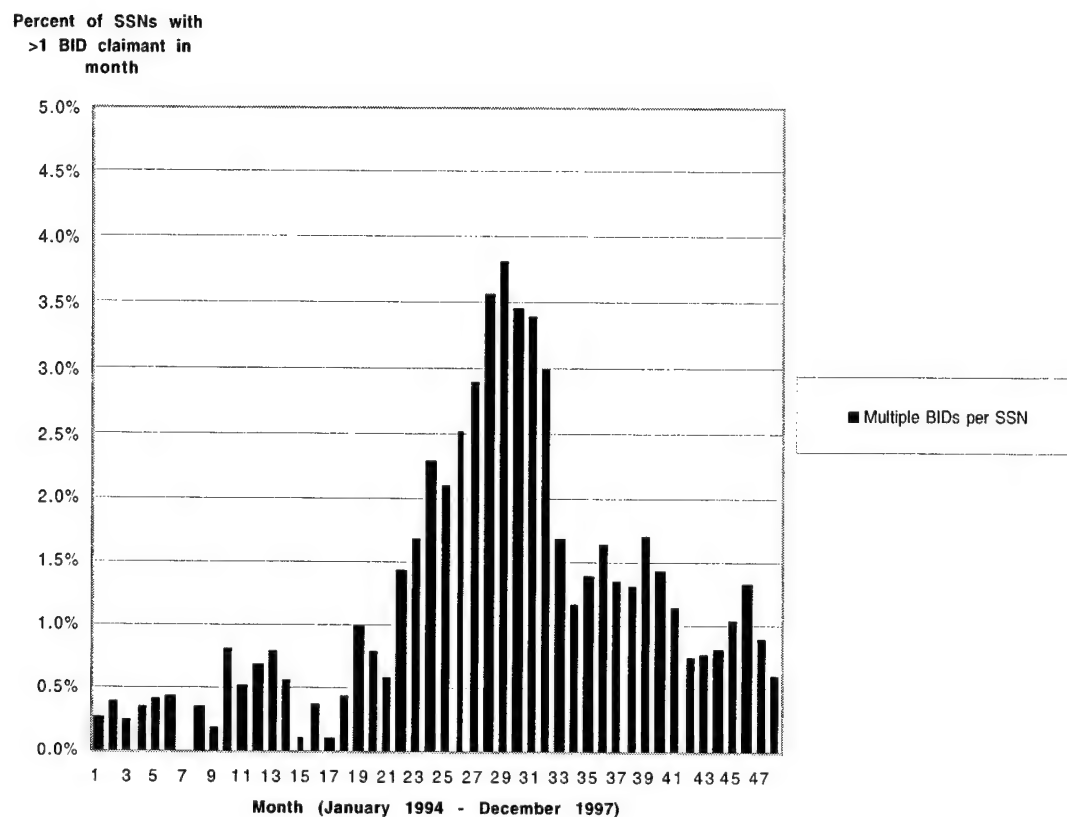
individual with a different aid code—the most frequently occurring combinations appeared to be between 30, 34, 35 (all low-income or cash assistance) or 38 (transitional Medi-Cal) and aid category 60 (SSI); between 40 (foster care aid category) and 42 (medically indigent child, foster care); and between 60 (SSI) and 72 (133 FPL for children one to six years of age) or 64 (medically needy disabled). None of these aid categories confers restricted Medi-Cal benefits.

In summary, these findings indicate that the numbers involved are not insubstantial but are unlikely to have a major impact on study outcomes. There was some indication of time trend, but the time trend did not appear to be steady and linear in all of the expansion counties. These patterns were found for both the mandatory and non-mandatory groups. In some counties, the majority of the occurrences involved two aid codes that conferred different mandatory group status, using the Two Plan model definition. The impact of these patterns depends upon the size of these estimates relative to the claimant volume changes overall. These patterns can be compared with the claimant volume changes to evaluate whether they comprise a significant part of any observed effects and whether inferences are sensitive to these patterns.

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APPENDIX C—PRE CARVE-OUT TIME TREND FOR EXPANSION AND NON-EXPANSION COUNTIES

Table C.1 – Results of tests for different time trend in pre carve-out years 1994-1995, for expansion and non-expansion counties, by mandatory group (coefficients and t statistics)

OLS for log(claimants)

Variable	Non-Mandatory				Mandatory			
	Two Plan & 36 non-expansion	Two Plan & 6 urban score of 0, 1, 2	Two Plan & 8 independent CCS counties	Two Plan & 11 non-expansion	Two Plan & 36 non-expansion	Two Plan & 6 urban score of 0, 1, 2	Two Plan & 8 independent CCS counties	Two Plan & 11 non-expansion
1995	0.16 (2.35)	0.08 (1.12)	0.13 (1.59)	0.13 (1.64)	0.16 (2.11)	0.15 (1.99)	0.15 (2.02)	0.15 (2.01)
1995*non-expansion county	-0.07 (0.90)	0.08 (1.16)	0.01 (0.11)	0.02 (0.22)	-0.18 (1.93)	-0.19 (1.65)	-0.03 (0.33)	-0.11 (1.11)
1994 (Qtr 3 or 4)	0.11 (4.26)	0.08 (3.00)	0.10 (3.30)	0.10 (3.44)	-0.03 (1.26)	-0.03 (1.59)	-0.04 (1.59)	-0.03 (1.59)
1995 (Qtr 1 or 2)	0.22 (3.40)	0.15 (2.53)	0.19 (2.78)	0.19 (2.85)	0.15 (2.60)	0.12 (1.12)	0.12 (1.11)	0.12 (1.12)
1995 (Qtr 3 or 4)	0.21 (2.84)	0.10 (1.54)	0.16 (1.98)	0.16 (2.06)	0.15 (2.60)	0.14 (2.52)	0.14 (2.50)	0.14 (2.52)
1994 (Qtr 3 or 4)*non-expansion county	-0.12 (2.29)	-0.11 (1.17)	0.07 (0.79)	0.04 (0.63)	-0.04 (0.83)	0.04 (0.76)	0.06 (1.00)	0.04 (0.80)
1995 (Qtr 1 or 2)*non-expansion county	-0.16 (1.90)	0.11 (0.97)	0.06 (0.53)	0.04 (0.41)	-0.16 (1.27)	-0.14 (1.10)	-0.06 (0.44)	-0.10 (0.78)
1995 (Qtr 3 or 4)*non-expansion county	-0.10 (1.19)	0.17 (1.98)	0.03 (0.24)	0.04 (0.38)	-0.24 (2.80)	-0.20 (1.50)	0.05 (0.68)	-0.09 (0.91)
N	1,152	432	480	552	1,152	432	480	552
F statistic for interaction terms	$F_{(3,47)}=2.3$ $p=0.09$	$F_{(3,17)}=2.4$ $p=0.10$	$F_{(3,19)}=0.3$ $p=0.80$	$F_{(3,22)}=0.1$ $p=0.94$	$F_{(3,47)}=3.0$ $p=0.04$	$F_{(3,14)}=4.0$ $p=0.03$	$F_{(3,19)}=1.0$ $p=0.44$	$F_{(3,22)}=0.6$ $p=0.60$

All models include log of Medi-Cal enrollment, PHP participation, and fixed county effects. Models with year interactions include 3 season dummy variables. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.

Table D.1 – Pre and Post carve-out percent of monthly claimants with claims in diagnosis categories: Endocrine/nutritional/metabolic, neoplasm, infection

Two Plan Model County	Months in Period		Diagnosis Category											
			Endocrine/Nutritional/Metabolic				Neoplasm				Infection			
			Non-Mandatory		Mandatory		Non-Mandatory		Mandatory		Non-Mandatory		Mandatory	
	N Pre	N Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Alameda	24	24	2.6%	3.7%**	2.8%	9.7%**	6.8%	5.3%**	5.7%	7.2%*	1.8%	2.9%**	1.8%	4.1%**
Contra Costa	37	11	2.2%	4.1%**	4.9%	7.9%*	6.6%	5.9%	6.1%	5.6%	1.4%	2.8%**	2.0%	2.0%
Fresno	34	14	2.7%	2.8%	1.7%	7.2%**	5.8%	5.7%	4.1%	6.3%**	1.3%	2.4%**	1.7%	2.2%
Kern	30	18	5.9%	5.3%	4.1%	6.1%**	6.8%	8.7%**	5.1%	6.2%	2.5%	2.8%	2.0%	3.1%**
Los Angeles	39	9	4.9%	4.9%	5.1%	5.4%	9.3%	9.3%	7.2%	8.0%*	3.1%	3.9%**	2.8%	3.5%**
Riverside	32	16	4.0%	5.8%*	8.8%	10.0%	5.4%	7.8%**	5.4%	6.3%	1.6%	1.8%	1.3%	2.6%**
San Bernardino	32	16	5.4%	4.8%	7.0%	8.3%*	6.5%	8.3%**	3.9%	7.2%**	2.0%	2.4%	1.4%	2.5%**
San Francisco	30	18	5.1%	4.7%	3.4%	5.1%**	9.2%	6.0%**	6.5%	4.4%*	3.3%	3.0%	2.3%	2.7%
San Joaquin	25	23	5.9%	5.0%	6.0%	9.1%**	6.8%	10.8%**	4.8%	7.1%**	3.1%	2.5%	1.5%	1.8%
Santa Clara	33	15	3.9%	3.3%	4.6%	4.3%	11.3%	6.4%**	10.4%	10.1%	2.5%	2.0%*	2.2%	1.7%
Stanislaus	37	11	3.2%	4.7%*	2.9%	6.7%**	6.3%	6.0%	5.4%	8.4%**	1.7%	3.7%**	2.5%	3.4%
All 11 counties[a]	353	175	4.1%	4.5%*	4.7%||	7.5%**	7.4%	7.4%	5.9%||	6.9%**	2.2%	2.7%**	2.0%||	2.7%**

[a] Unweighted by county population (p values from test of equality of means Pre vs. Post, $F_{(1,526)}$, except where noted)

|| $p < 0.05$ for comparison of Mandatory vs. Non-mandatory groups in Pre period, $F_{(1,704)}$

* $p < 0.05$ for comparison of Pre months vs. Post months, $F_{(1,46)}$

** $p < 0.01$ for comparison of Pre months vs. Post months, $F_{(1,46)}$

Total months in the observed Pre and Post periods correspond to carve-out dates for each county

Table D.2 – Pre and post carve-out percent of monthly claimants with claims in diagnosis categories: Blood-related, psychiatric, nervous system

Two Plan Model County	Months in Period		Diagnosis Category											
			Blood-related				Psychiatric				Nervous System			
			Non-Mandatory		Mandatory		Non-Mandatory		Mandatory		Non-Mandatory		Mandatory	
	N Pre	N Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Alameda	24	24	7.0%	6.9%	4.4%	8.0%**	0.9%	1.6%**	1.1%	1.2%	33.8%	36.3%	8.6%	8.0%
Contra Costa	37	11	4.9%	5.6%	4.3%	5.5%	0.6%	1.0%	0.5%	0.4%	34.0%	29.2%	8.9%	6.3%
Fresno	34	14	5.7%	5.1%	4.8%	7.1%**	0.4%	1.6%**	0.1%	1.1%**	12.2%	14.1%**	4.0%	5.8%**
Kern	30	18	3.5%	4.2%*	2.1%	3.1%*	0.6%	1.0%*	0.4%	0.5%	19.8%	20.8%	5.0%	5.5%
Los Angeles	39	9	5.2%	5.5%	3.8%	4.0%	1.2%	1.3%	0.7%	0.6%	29.8%	32.8%	6.9%	8.2%**
Riverside	32	16	3.3%	3.5%	1.6%	2.5%*	0.4%	1.0%**	0.1%	0.5%**	30.5%	28.9%	6.6%	6.7%
San Bernardino	32	16	4.2%	3.5%*	2.6%	2.3%	0.7%	1.1%**	0.3%	0.5%	25.2%	38.3%**	5.1%	7.3%**
San Francisco	30	18	4.4%	3.6%*	3.7%	3.5%	1.9%	2.0%	0.5%	0.4%	24.5%	37.4%**	7.7%	17.7%**
San Joaquin	25	23	4.3%	3.7%	1.0%	1.9%**	0.8%	0.8%	0.1%	0.4%	33.5%	35.7%	5.6%	8.4%**
Santa Clara	33	15	3.6%	2.9%*	4.6%	2.5%**	0.7%	0.4%	0.9%	0.7%	33.1%	33.9%	9.8%	9.6%
Stanislaus	37	11	3.2%	3.3%	2.6%	3.8%	0.7%	0.9%	0.2%	0.2%	32.0%	35.8%	6.9%	6.3%
All 11 counties [a]	353	175	4.4%	4.4%	3.3%||	4.0%**	0.8%	1.2%**	0.4%||	0.6%**	28.0%	31.6%**	6.8%||	8.4%**

[a] Unweighted by county population (p values from test of equality of means Pre vs. Post, $F_{(1,526)}$, except where noted)

|| p<0.05 for comparison of Mandatory vs. Non-mandatory groups in Pre period, $F_{(1,704)}$

* p<0.05 for comparison of Pre months vs. Post months, $F_{(1,46)}$

** p<0.01 for comparison of Pre months vs. Post months, $F_{(1,46)}$

Total months in the observed Pre and Post periods correspond to carve-out dates for each county

Table D.3 – Pre and post carve-out percent of monthly claimants with claims in diagnosis categories: Sensory, circulatory, respiratory

Two Plan Model County	Months in Period		Diagnosis Category											
	N Pre	N Post	Sensory				Circulatory				Respiratory			
			Non-Mandatory		Mandatory		Non-Mandatory		Mandatory		Non-Mandatory		Mandatory	
			Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Alameda	24	24	7.9%	9.4%**	13.8%	10.4%**	1.9%	2.5%*	3.5%	4.1%	4.7%	6.0%**	4.1%	5.0%
Contra Costa	37	11	9.3%	12.7%**	11.9%	14.1%	2.6%	3.2%	2.0%	4.6%**	5.1%	5.5%	3.7%	4.2%
Fresno	34	14	9.9%	9.2%	15.0%	12.3%*	0.9%	2.2%**	1.6%	3.7%***	3.3%	5.8%**	2.9%	6.5%**
Kern	30	18	8.5%	9.4%	11.4%	12.7%	1.6%	2.5%**	2.5%	3.9%*	6.9%	10.8%***	6.2%	4.2%***
Los Angeles	39	9	8.1%	8.0%	10.6%	9.6%*	2.3%	2.2%	2.7%	2.6%	9.8%	9.8%	7.9%	6.1%**
Riverside	32	16	5.0%	5.7%	7.3%	8.4%	2.0%	2.3%	2.0%	4.5%**	5.2%	6.1%	4.7%	9.0%***
San Bernardino	32	16	4.5%	4.2%	7.9%	8.8%	1.8%	3.0%**	2.2%	4.1%**	6.7%	6.7%	5.1%	6.2%
San Francisco	30	18	9.5%	10.2%	12.7%	11.5%	1.4%	2.5%**	2.8%	2.5%	10.3%	9.3%	8.2%	6.5%
San Joaquin	25	23	7.6%	5.9%*	16.8%	10.1%**	4.9%	3.2%***	1.3%	4.7%**	7.2%	7.8%	7.1%	6.6%
Santa Clara	33	15	5.1%	5.7%	7.6%	7.5%	3.2%	2.2%**	3.4%	3.8%	5.1%	4.7%	4.5%	4.9%
Stanislaus	37	11	4.8%	3.9%	8.0%	6.3%	2.9%	1.8%*	2.7%	1.9%	3.9%	4.6%	2.4%	5.9%**
All 11 counties [a]	353	175	7.3%	7.7%	11.0%||	10.2%	2.3%	2.6%*	2.4%	3.8%**	6.2%	7.1%**	5.1%||	5.9%**

[a] Unweighted by county population (p values from test of equality of means Pre vs. Post, $F_{(1,526)}$, except where noted)
|| $p<0.05$ for comparison of Mandatory vs. Non-mandatory groups in Pre period, $F_{(1,704)}$
* $p<0.05$ for comparison of Pre months vs. Post months, $F_{(1,46)}$
** $p<0.01$ for comparison of Pre months vs. Post months, $F_{(1,46)}$
Total months in the observed Pre and Post periods correspond to carve-out dates for each county

Table D.4 – Pre and post carve-out percent of monthly claimants with claims in diagnosis categories: Digestive, genitourinary, musculoskeletal/connective tissue

Two Plan Model County	Months in Period		Diagnosis Category											
			Digestive				Genitourinary				Musculoskeletal/Connective Tissue			
			Non-Mandatory		Mandatory		Non-Mandatory		Mandatory		Non-Mandatory		Mandatory	
	N Pre	N Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Alameda	24	24	3.7%	4.0%	4.2%	4.7%	1.8%	1.8%	2.3%	4.4%**	4.9%	4.0%*	5.6%	4.9%
Contra Costa	37	11	3.5%	3.6%	4.2%	6.1%*	1.5%	2.0%	1.7%	3.7%**	3.0%	4.9%**	4.8%	8.1%**
Fresno	34	14	1.8%	3.6%**	2.2%	4.6%**	1.8%	3.9%**	1.7%	6.2%**	3.8%	3.1%	5.7%	10.4%**
Kern	30	18	4.6%	4.6%	4.2%	3.0%	2.4%	2.7%	3.4%	6.1%**	4.6%	4.6%	4.9%	4.9%
Los Angeles	39	9	4.7%	5.3%**	4.5%	5.0%*	4.0%	4.0%	4.8%	4.9%	4.5%	4.2%	6.8%	7.1%
Riverside	32	16	3.9%	5.4%**	4.1%	5.9%**	2.2%	3.8%**	2.4%	3.9%**	4.4%	5.1%	4.3%	6.1%**
San Bernardino	32	16	3.6%	3.9%	3.2%	4.3%**	1.7%	2.2%**	2.0%	2.9%**	4.6%	5.4%**	5.9%	7.5%**
San Francisco	30	18	5.7%	5.5%	3.8%	7.2%**	1.9%	2.4%	4.7%	4.8%	3.6%	5.8%**	5.8%	9.9%**
San Joaquin	25	23	3.2%	3.4%	3.5%	3.4%	2.1%	2.1%	3.7%	4.5%	4.0%	4.2%	4.0%	4.3%
Santa Clara	33	15	3.7%	3.5%	3.5%	3.4%	2.8%	2.0%*	4.3%	3.8%	3.6%	3.6%	4.5%	5.5%
Stanislaus	37	11	2.8%	3.5%	3.4%	3.1%	1.9%	1.1%	2.6%	3.4%	4.3%	5.5%	2.6%	5.8%**
All 11 counties [a]	353	175	3.7%	4.2%**	3.7%	4.6%**	2.2%	2.5%*	3.0%||	4.5%**	4.1%	4.6%**	5.0%||	6.5%**

[a] Unweighted by county population (p values from test of equality of means Pre vs. Post, $F_{(1,526)}$, except where noted)

|| $p < 0.05$ for comparison of Mandatory vs. Non-mandatory groups in Pre period, $F_{(1,704)}$

* $p < 0.05$ for comparison of Pre months vs. Post months, $F_{(1,46)}$

** $p < 0.01$ for comparison of Pre months vs. Post months, $F_{(1,46)}$

Total months in the observed Pre and Post periods correspond to carve-out dates for each county

Table D.5 – Pre and post carve-out percent of monthly claimants with claims in diagnosis categories: Congenital anomaly, perinatal, accident/poisoning/violence/immunization reaction

Two Plan Model County	Months in Period N Pre	N Post	Congenital Anomaly Non-Mandatory Pre	Post	Mandatory Pre	Post	Perinatal Non-Mandatory Pre	Post	Mandatory Pre	Post	Accident/Poisoning/Violence/IZ reaction Non-Mandatory Pre	Post	Mandatory Pre	Post
Alameda	24	24	13.8%	15.3%**	22.3%	21.0%	5.7%	6.0%	18.6%	14.1%**	5.6%	6.4%	10.5%	13.3%**
Contra Costa	37	11	15.2%	17.2%	22.0%	31.7%**	8.4%	5.6%**	21.0%	12.6%**	5.8%	5.9%	8.7%	13.8%**
Fresno	34	14	8.4%	10.8%**	16.2%	22.0%**	3.6%	4.0%	13.5%	10.1%**	4.0%	4.5%	8.7%	16.9%**
Kern	30	18	17.1%	19.1%*	18.8%	22.0%*	2.2%	7.6%**	8.1%	17.4%**	4.3%	5.0%	9.1%	15.0%**
Los Angeles	39	9	17.1%	17.4%	21.4%	24.4%**	4.7%	3.8%**	7.9%	7.0%*	6.6%	5.8%**	12.0%	12.3%
Riverside	32	16	15.2%	14.5%	20.9%	21.9%	5.1%	5.1%	13.7%	11.2%**	5.2%	5.8%	7.1%	12.8%**
San Bernardino	32	16	15.8%	14.4%**	18.0%	20.7%**	4.6%	3.5%**	12.2%	10.5%	6.5%	7.1%	13.0%	14.0%
San Francisco	30	18	16.2%	14.8%	18.7%	16.1%*	6.3%	4.2%**	7.4%	6.1%	5.9%	6.2%	12.0%	14.1%
San Joaquin	25	23	15.7%	15.3%	23.5%	22.6%	1.8%	2.3%	10.2%	10.8%	4.1%	4.7%	5.5%	10.9%**
Santa Clara	33	15	18.1%	16.8%	21.8%	25.7%**	11.2%	8.7%	14.7%	11.2%**	5.0%	3.4%**	9.5%	11.2%
Stanislaus	37	11	17.6%	21.5%**	20.4%	24.8%	5.3%	3.7%*	19.2%	10.8%**	4.4%	5.6%	5.5%	8.3%*
All 11 counties [a]	353	175	15.5%	15.9%	20.3%||	22.4%**	5.5%	5.0%	13.4%||	11.4%**	5.2%	5.5%	9.3%||	13.0%**

[a] Unweighted by county population (p values from test of equality of means Pre vs. Post, $F_{(1,526)}$, except where noted)
|| $p < 0.05$ for comparison of Mandatory vs. Non-mandatory groups in Pre period, $F_{(1,704)}$
* $p < 0.05$ for comparison of Pre months vs. Post months, $F_{(1,46)}$
** $p < 0.01$ for comparison of Pre months vs. Post months, $F_{(1,46)}$
Total months in the observed Pre and Post periods correspond to carve-out dates for each county

Table D.6 – Pre and post carve-out percent of monthly claimants with claims in diagnosis categories: Other and Vcodes/Ecodes

Two Plan Model County	Months in Period		Diagnosis Category							
			Other				Vcodes and Ecodes			
	N	N	Non-Mandatory		Mandatory		Non-Mandatory		Mandatory	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Alameda	24	24	35.8%	36.2%	21.0%	20.5%	5.3%	5.4%	8.6%	7.4% *
Contra Costa	37	11	32.9%	34.6%	21.8%	19.5%	5.1%	6.4% *	9.4%	7.2% *
Fresno	34	14	59.4%	67.0% **	23.5%	25.2%	3.9%	4.1%	5.2%	5.9%
Kern	30	18	40.0%	41.2%	23.5%	25.6%	8.1%	9.2%	17.3%	18.3%
Los Angeles	39	9	26.6%	30.2% **	16.4%	19.6% **	9.1%	8.6%	10.5%	10.3%
Riverside	32	16	40.9%	44.3% *	27.5%	28.0%	12.1%	14.7% **	12.4%	16.8% **
San Bernardino	32	16	42.8%	39.5% *	27.1%	31.5% **	14.7%	11.8% **	13.6%	15.6% *
San Francisco	30	18	39.3%	38.8%	16.3%	23.3% **	9.1%	7.6% *	13.8%	10.9% *
San Joaquin	25	23	35.2%	41.3% **	15.9%	24.7% **	6.9%	7.1%	12.6%	12.2%
Santa Clara	33	15	32.8%	43.2% **	18.5%	25.1% **	9.1%	6.7% **	10.2%	7.8% **
Stanislaus	37	11	41.1%	42.4%	21.3%	25.5% *	7.1%	7.6%	19.3%	19.8%
All 11 counties [a]	353	175	38.7%	41.7% **	21.2%‖	24.5% **	8.3%	8.0%	12.1%‖	12.0%

[a] Unweighted by county population (p values from test of equality of means Pre vs. Post, $F(1,526)$, except where noted)

‖ $p < 0.05$ for comparison of Mandatory vs. Non-mandatory groups in Pre period, $F(1,704)$

* $p < 0.05$ for comparison of Pre months vs. Post months, $F(1,46)$

** $p < 0.01$ for comparison of Pre months vs. Post months, $F(1,46)$

Total months in the observed Pre and Post periods correspond to carve-out dates for each county

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